



Draft Final Report
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Re: CUY-71/90 CIB
Economic Impact Study

Submitted by:

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I. Introduction

A. Purpose of the Study

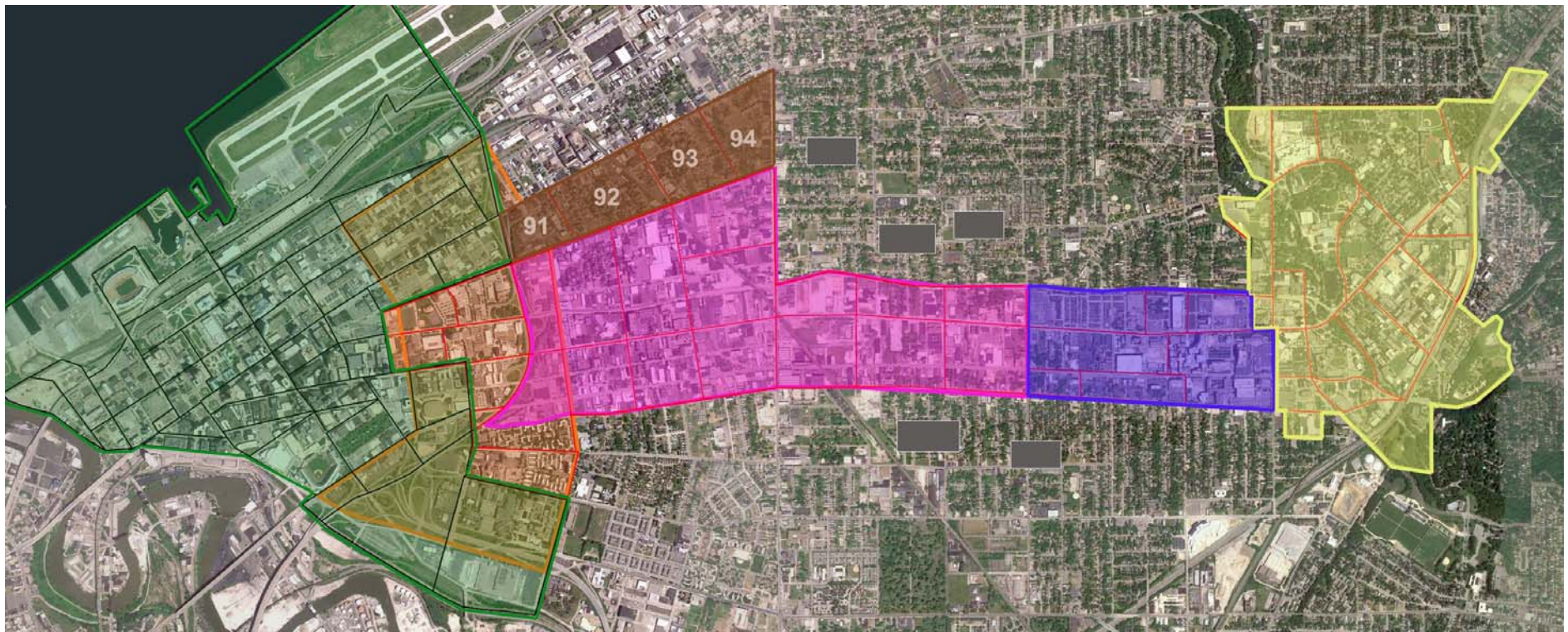
This study has been prompted by concerns expressed by MidTown Cleveland Inc., and its individual stakeholders, that the interchange configuration (I-90 @ Carnegie Ave. and Prospect Ave.) proposed by ODOT will have significant adverse economic impact on existing businesses and future development of the MidTown Corridor which, for the purposes of this Study, is the entire Health and Technology Corridor (“The Health Tech Corridor”) which extends from Cleveland State University to University Circle (**Map 1**).

In response to this concern, this Study includes a comprehensive assessment of the economic implications of the alternative circulation patterns on: development investment, location and relocation decisions, customer interest, and the overall attractiveness on the Midtown Corridor area. Downtown development also has a direct relationship to circulation in and around the Innerbelt. Therefore, future development in Downtown has also been forecast, and the resulting traffic patterns have been included as part of this assessment. The boundaries of Downtown are also included on **Map 1**.

This report, among other factors considers:

1. The significance of the changing transportation implications compared to the multiple factors influencing investment, location, occupancy and customer choices.
2. The extent to which short-term reactions – to the transportation changes – are adjusted, or mitigated over time – by other important considerations.
3. The level of overall change forecast because of the circulation impacts compared to:
 - a. The overall investment that can be anticipated, and
 - b. The normal fluctuations – ebb and flow – of business and customer behavior.
4. The extent to which the circulation modifications result in:
 - a. Inconvenience – which may or may not become acceptable over time, or
 - b. Increased congestion for which there is no, or little, likelihood of short-term relief.
5. The extent to which increased traffic congestion is acceptable as a contributing positive by-product of the economic development and social vibrancy desired, hoped for, and expected in the Health Tech Corridor and Downtown.
6. The extent to which distance from the Innerbelt influences economic consequences – both positive and negative.

Map 1 – Study Area



Downtown
Zones 44-90

Campus District
Zones 1-9

Midtown
Zones 7 & 9 (overlap w/ Campus District)
Zones 10-22
Zones 91-94

Cleveland Clinic
Zones 24-29

University Circle
Zones 30-43

— Downtown Zones
— Health Tech Corridor Zones

Innerbelt Study Area Traffic Zones & Neighborhoods



B. Historical/Existing Context

The current Innerbelt Bridge has now exceeded its useful “design life.” The trench portion of the Innerbelt – from E 9th Street to the East Shoreway – has substandard design compared to current road and construction standards. Based on the numerous studies of the existing conditions conducted by ODOT both the bridge and the trench portion of the Innerbelt need to be replaced for structural integrity and to improve traffic flow and safety on the Innerbelt and adjacent ramps and intersections. Specifically, the trench replacement will improve flow and safety along the road segment between the bridge and the Shoreway curve by: cutting down weaving; increasing the capacity of ramps; and reducing the “bottle necks” on the Innerbelt by improving the capacity of the road, the related ramps, and the immediately adjacent surface streets.

The first half of the bridge will be completed this Fall (2013); the second phase of the bridge immediately thereafter. Depending on funding and phasing, reconstruction of the trench could be a three (3) to six (6) year construction project.

C. Study Area

The Study area (**Map 1**) includes the Health Tech Corridor extending from University Circle to the Innerbelt and Downtown which is bounded by the Innerbelt, Lake Erie, and the Cuyahoga River.

D. ODOT’s Methodology for the Innerbelt Evaluation

ODOT completed the traffic and environmental assessment for the proposed project. The ODOT study did not evaluate the implications of the changing traffic patterns on the surface streets farther from the Innerbelt than, approximately, E 30th Street. Furthermore, ODOT’s future traffic projections were based on NOACA’s model that essentially assumed no appreciable growth occurring in the Health Tech Corridor or Downtown. Additionally, ODOT’s sphere of influence did not fully consider the shift in traffic patterns from one east/west arterial to another that might occur as a result of the interchange reconfiguration. Since several years have elapsed since the ODOT traffic assessment was completed, current traffic volumes at key intersections were not available when this Study was authorized. Therefore, the Consultants requested, and were authorized to complete, updated existing traffic counts for key intersections along the main east west arteries – Chester, Euclid, Prospect and Carnegie. The traffic counts were completed in March of 2013.

ODOT and the NOACA traffic model have assumed (and this study has as well) that Opportunity Corridor would be completed prior to the end of the twenty-two year study period.

E. Overview of the Community’s Response – Midtown and Others

In response to the ODOT plan, Midtown Cleveland asserted that eliminating the interchanges at Prospect and Carnegie would adversely affect economic development in the area – including the

Health Tech Corridor. Among other factors, MidTown cited as factors adversely influencing development:

1. The more indirect circulation routes would inconvenience employers, employees and customers because of the increased travel times; and
2. Increased congestion because of fewer interchanges and the potential that shifting traffic patterns would create additional congestion on the east/west arteries.

Midtown sued ODOT alleging that these adverse impacts were detrimental to the neighborhood and, further, that ODOT's evaluations had not satisfied the "environmental impact statement" requirements. Other organizations and community leaders voiced similar concerns, even opposition to the proposal, for the same reasons as above but also cited some additional reasons as disturbance during construction and reduced connectivity between downtown and the Health-Tech Corridor.

To settle the law suit ODOT and Midtown agreed to issue a Request for Proposals and jointly selected this Consultant Team from the proposals received. The signed contract resulted in the law suit being dropped.

F. Assumptions Related to the Study Scope

Several assumptions are important to recognize which are related to the limited scope of this study.

1. The Innerbelt will be constructed. The purpose of this report is limited to the economic assessment of three interchange alternatives; which includes the implications of the traffic assessment for each of the alternative interchanges – whether delay, inconvenience, or perceptions. Addressing the general question of whether the Innerbelt improvements are needed is not part of this Study.
2. There will likely be inconvenience and business interference during construction; however, the detailed assessment of such impacts is not part of this Study.
3. If traffic congestion is determined to be an increasing issue – because of the interchange configuration – then recommendations to mitigate economic impacts may include considering some changes to the local streets – lanes, turning movements, traffic signals and timing – to improve flow, convenience, and orientation.

G. Interchange Alternatives

The three (3) interchange alternatives – referred to as "**Traffic Scenarios**" - that are the subject of this evaluation (**Scenario 1 - The existing interchange configuration; Scenario 2 - The configuration proposed by ODOT; and Scenario 3 – The "middle ground" alternative that restores the Carnegie eastbound off-ramp**) are summarized in **Exhibit 1** and depicted on Maps 2A, 2B, and 2C.

Exhibit 1
Existing & Proposed Ramps – With Alternatives

	Scenario 1 Existing	Scenario 2 ODOT Proposed	Scenario 3 Consultants “Middle Ground” Alternative
Off Ramps	NB East 22nd	NB East 22nd	NB East 22nd
	NB Carnegie	--	NB Carnegie
	SB Prospect	--	--
	NB Chester	NB Chester	NB Chester
	SB Chester/East 24th	SB Chester/East 24th	SB Chester/East 24th
	NB Superior	NB Superior	NB Superior
	SB Superior	SB Superior	SB Superior
On Ramps	SB Carnegie/East 14th	SB Carnegie/East 14th	SB Carnegie/East 14th
	NB Prospect	--	--
	SB Prospect	--	--
	NB Chester	NB Chester	NB Chester
	SB Chester/East 24th	SB Chester/East 24th	SB Chester/East 24th
	SB Superior	SB Superior	SB Superior
	NB Superior	NB Superior	NB Superior

II. Framework For the Evaluation

A. The Community Response

The Consultants agreed to conduct conversational interviews with forty-seven (47) community stakeholders. We completed thirty-two (32) interviews with three (3) of those declining to be interviewed because they felt there would be no impact or they had no comment.

While the nature of the interviews was “conversational” the interviews generally followed the script in the interview form in **Appendix E**. We have summarized the interviews in the aggregate as we stated to many of those interviewed that their responses could remain confidential; many accepted that condition.

Not surprisingly, the stakeholder responses overwhelmingly continue to be against the reduction in interchanges because (in the order most often mentioned):

1. Inconvenience;
2. Increased congestion;
3. Perception that any change is reality and the customer and/or employee will not readily accept and adjust;
4. Connectivity within the City is reduced, in part, because if a driver misses a remaining interchange a longer stretch of highway is traveled before the driver is able to turn around and correct the mistake;
5. People will be uncomfortable using different, or unfamiliar streets in the City;
6. Adverse economic impacts from the disruption during the time of construction.

The Consultants believe that, quite often (but not all), those interviewed did not have an understanding of why the trench improvements were being proposed and what the benefits to the area might be as understood by ODOT. It should be pointed out, however, that greater understanding or confidence in the benefits would not necessarily, it seems, change opinions. Several did say, despite objections to the entire project, that improvements to the Innerbelt curve at the Shoreway were important.

B. Level of Driving Inconvenience

ODOT’s interchange proposal will increase travel time and distances required for some, to reach the intended destination. However, travel time and distances will be reduced for others. – assuming no increased congestion. The “diversion” caused by the revised (ODOT) interchange configuration will require, at most, 1 to 1 ½ minutes in additional travel time to get to the “previously intended starting spot.” But, not all diverted traffic will need to reach the “starting

spot” since alternative routes to the final destination may be more convenient and actually reduce “the additional time required.”

While the route adjustments – any change in traffic patterns for that matter – may be unsettling at first, driver habits and patterns could soon adjust and the perceptions of the additional time required and inconvenience may be forgotten.

III. Development Estimates – Existing and Proposed

A. Purpose

In order to gauge potential impacts of alternative interchange possibilities, existing and future development estimates needed to be established under the presumption that if no transportation changes were to occur, some level of potential development will happen by 2035. The difference between the existing and future outcomes provides the benchmark for assessing different outcomes based on the alternative interchange configurations. Since the economic impacts are affected by levels of activity and the levels of activity, to at least some degree, are influenced by vehicular circulation patterns, the forecasts include: the estimated level of activity, the vehicles that would be “used in the area” each day for the activities, and the increase in the vehicle trips per day.

B. Methodology

Estimated Level of Activity (*Exhibit 2*) : Both the existing and future development outcomes have been estimated by preparing separate development forecasts for Downtown and the Health-Tech Corridor. The boundaries for each area are depicted on **Map 1**.

Purposes of existing development estimates establishes the benchmark for evaluating the level of future change – both economic development and related traffic considerations - to the target year 2035.

The development estimates have been distributed to the individual traffic zones, or groups of traffic zones, which are depicted on **Map 3**.

A single source with comprehensive data summarizing existing development activity is not available. Therefore, the existing development has been estimated by utilizing a variety of sources and techniques

1. County GIS data for building sizes and uses;
2. Data from multiple public and private organizations (web sites, brochures, annual reports, long range plans, articles, press releases, etc.);
3. Interviews/meetings with key stakeholders; and
4. Verification of the information, where possible, from multiple sources and by applying “reasonableness tests” based on the Consultants knowledge of the history, existing conditions and trends in Cleveland and the region.

Future development estimates were also derived from a variety of sources such as: specific estimates reported to the Consultants – written and oral; forecasts made by the consultants from various published development plans; and/or utilizing annual percentage increases when information was not otherwise provided.

The data sources and methodology for each component is included in the footnotes to each detailed Exhibit in the Appendix.

Both the, existing and future activity estimates have been reasonably distributed to weekdays, weeknights, and weekends in order to assess the impacts from multiple perspectives: to gage the total number of people that could be **inconvenienced** by the revised interchanges and determine the time of day or week such inconvenience might occur; to estimate the total number of people that might experience increased **congestion** particularly during the typical PM week day “peak hours;” and, to better isolate the magnitude and level of frequency (or infrequency) of special, high attendance events such as Gateway (baseball, basketball, concerts) and First Energy Stadium.

Weekday activity is generally from 7 a.m. to 6 p.m.; weeknights from 6 p.m. to 2 or 3 a.m.; and weekends are the full 24 hour days. The level of activity from 3 AM to 7 AM is generally insignificant and has not been considered.

When annual estimates of attendance/visitors were available they were allocated to estimates of “daily levels of activity.” In some cases the allocations were provided (e.g. First Energy Stadium) in other cases the allocations were based on reasonable estimates by the Consultants. In some cases, the daily allocations were: divided over all days (i.e. hotels, residents, rock hall). In other cases the totals the totals were divided over the number of days the activity/event took place (i.e. Wolstein Center, Gateway, Playhouse Square, etc.).

In downtown, while additional retail is expected, no additional increase in the activity level has been attributed to such retail increase since, for most of the retail, it is assumed that the retail customers are currently downtown for other reasons. Furthermore adding a retail component would “statistically” result in only a small change to the overall projections.

The total peak activity estimates (**Exhibit 2**) are realistic but do not occur equally at the same level because:

1. Week night and week end activities do not all occur at the same time nor every day;
2. Many activities are occasional; and
3. For the most part, these large fluctuations occur in the evening or weekends when the overall level of activity is down.

Estimates of Vehicles in Use Per Day (Exhibit 3): Adjustments have been made in the “estimates of activity” to reflect more realistically the level of vehicles actually used in a day by deducting:

1. The number of people that use public transit regularly.
2. The number of people that are included in multiple categories and, therefore, the same person has been counted more than once.
3. Residents that also work downtown (estimated to be 50%);

4. Hotel guests are also likely to be visitors to other venues - Indians, Browns, Cavs (5%); Rock Hall & Aquarium (20%); and Playhouse Square (5%).
5. Multiple persons in a single vehicle – particularly as visitors and patrons to events (Playhouse Square, Gateway, First Energy Stadium).

Estimates of Daily Vehicle Trip-ends (*Exhibit 4*): The Institute of Highway Engineers Trip Generation Manual (TGM) basis its daily trip generation estimates on either: (1) The number of employees at a specific use; or (2) The amount of square feet for a specific use.

However, the “level of activities” has not been compiled in categories that can be easily compared to the TGM estimates. Furthermore, the TGM has a wide range of possible outcomes for each use category and most of the samples of traffic estimates may not reflect the urban environment of Downtown and the HTC. Therefore, rather than relying on ranges or averages, the Consultants believe that relying on our collective experiences a “custom estimate” more accurately reflects the level of activity and potential future trips in the study area. For all activities (except retail) the Consultants have assigned daily trips for each of the categories and locations in the Study Area using the following to arrive at the trip generation estimates:

1. Residential, Downtown – three (3) trips per dwelling unit per day.
2. Residential, Health Tech Corridor – four (4) trips per dwelling unit per day.
3. Students – one (1) student per car and two trips per day.
4. Employees – one (1) employee per car and three (3) trips per employee per day which includes one extra in/out trip for every two employees
5. Visitors – 1.25 persons per vehicle and two trips per vehicle per day

The forecast in daily vehicle trips includes regular weekday and weeknight activities for residents, employment, regular daily visitations. The estimates do not include specialized visitation on weekends (i.e. Cleveland Browns, the Q) or infrequent events on weeknights (i.e. Indians, the Q) or additional trips “around the Study Area” by hotel guests beyond the trips to and from the hotel. No trip estimates have been made for any future retail development.

The trip generation estimates were assigned to each traffic zone by considering such factors as: the proportion of the area’s floor area in each traffic zone – from the County’s GIS; the Consultants’ knowledge of the uses and the intensity of activity in each zone; the conversational interviews; and the movements expected – i.e. students, walking distances, etc. If, however, the trip assignments have not been accurately distributed by traffic zone, the circulation patterns would not be materially altered.

To reflect consistency with NOACA’s traffic model we were required to assign a location for the “other end of the trip” – generally the “origin” for the traffic going into the study area every day. For the residents living in the Study Area these would be the “destination” for residents who work outside of the study area. These have been evenly distributed across the primary “external

stations” (which are the highway entry points into the NOACA Region) provided by NOACA. Even if the trip origin is on a minor external station the trip will merge onto a primary corridor prior to reaching Downtown or the HTC. Based on the highway network and travel patterns, “even distribution” results in the trips to the Health Tech Corridor being approximately: 60-70% from the Innerbelt, 20-25% through University Circle, 10-15% from the east on “surface” streets, and 5% from the south using 55th Street, 79th Street, 105th Street, etc. The distribution of the daily trips is assumed to be the same for both Options 1 and 2.

The trip generation estimates were transmitted to NOACA to apply these estimates to the existing traffic volumes in their regional traffic model. The model was run to estimate the proportional changes in traffic volumes at key intersections from the Innerbelt to E. 105 Street in the year 2035. The 2035 traffic estimates were only applied to Option 1. Any adjustments deemed warranted by the Consultants – to reflect more realistic estimates have been made by the Consultants on a proportional basis.

C. Summary of Development Forecasts (*Exhibits – 2, 3 and 4*)

Option 1 includes all known future projects, assumes that potential development will occur as envisioned in the variety of plans that have been promulgated by multiple organizations, and makes “straight line” projections when other forecasts are not available. This **Option 1** is based on the assumption that, while normal fluctuations in the pace of activity will occur, there will be no disruption in the current development momentum in the Study Area; and there will be no significant increase in public transportation ridership.

Since this outcome could be higher than might be deemed “realistically attainable,” Option 1 has been determined to be the high estimate. Based on this determination, **Option 2** is, therefore, “adjusted downward” from the Option 1 forecast and represents a “mid-range forecast.” The **Option 2** has been established by: reducing all of percentage increases (in Option 1) in half; deleting the construction of any new office buildings downtown over and above the Flats East Bank project under construction; and reducing the expected development outcomes from long range plans (Mid-town, campus district, Lake Front) in half.

These estimates reflect:

1. An overall annual increase in activity between .91% (**Option 2**) to 1.4% (**Options 1**).
2. The projections for sports and entertainment are less frequent and do not readily affect daily peak hour traffic. Nonetheless, regardless of attendance to these events, traffic near the destination may burden the road capacity for short periods on the limited occurrences that these facilities are near capacity.
3. No additional growth has been estimated for retail since, for the most part, retail trips are accounted for in the area; however some could come from outside.

Based on a review of recent population and employment trends in seventeen (17) other cities: population changes between 1990 and 2010 ranged from -1.5% per year to +1.5% per year; the average change being -.16% per year; employment changes between 2002 and 2010 ranged from -1.42% per year to +2.13% per year; the average change being +.06% per year. These are

citywide figures and do not include activities related to visitors or special attractions. Furthermore, there is possibility that downtown locations and adjacent neighborhoods could be performing at higher rates than the citywide averages.

IT has been expressed by some, since the progress report reviewed last fall, which compared to recent trends, our estimates are unrealistic. Several observations support these trends since the forecasts were initially completed in the fall of 2012. There is substantial evidence that development in the Study Area is occurring at a faster rate, than the forecasts indicate, particularly for the daily activities that routinely affect peak hour traffic. For example:

1. Residential (downtown): It is now extremely likely based on residential projects “in the works” that within two years an additional 1,400 units with 2,100 residents will be downtown. That is 25% of the forecast in 9% of the years.

Exhibits 2, 3, and 4

Exhibit 2- Summary of Total Activities Per Day: Existing & Options

Summary derived from Exhibits 7 & 10

	Existing			Option 1			Option 2			% Change (Option 1 & Option 2)		
	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend
Downtown	136,200	60,900	125,800	177,950	89,450	160,000	167,450	84,550	155,100	-6%	-5%	-3%
Health-Tech Corridor	93,920	34,115	40,120	126,720	47,515	59,520	110,720	41,065	48,020	-13%	-14%	-19%
Total Daily Activity Levels	230,120	95,015	165,920	304,670	136,965	219,520	278,170	125,615	203,120	-9%	-8%	-7%
% Change (Existing & Option)												
Weekday	-			32%			21%					
Weeknight		-			44%			32%				
Weekend			-			32%			22%			

Exhibit 3 - Summary of Vehicles in Use Per Day: Existing & Options

Summary derived from Exhibits 8 & 11

	Existing			Option 1			Option 2			% Change (Option 1 & Option 2)		
	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend
Downtown	122,120	35,620	64,750	153,905	51,655	83,800	139,405	48,205	80,350	-9%	-7%	-4%
Health-Tech Corridor	81,385	27,085	32,235	110,625	37,835	47,285	96,435	32,685	38,635	-13%	-14%	-18%
Total Daily Vehicles in Use	203,505	62,705	96,985	264,530	89,490	131,085	235,840	80,890	118,985	-11%	-10%	-9%
% Change (Existing & Option)												
Weekday	-			30%			16%					
Weeknight		-			43%			29%				
Weekend			-			35%			23%			

Exhibit 4 - Summary of Total Vehicle Trips Per Day: Existing & Options

Summary derived from Exhibits 9 & 12

	Existing			Option 1			Option 2			% Change (Option 1 & Option 2)		
	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend
Downtown	342,390	73,040	150,250	422,110	103,110	199,700	383,010	97,010	187,100	-9%	-6%	-6%
Health-Tech Corridor	212,650	66,700	104,250	291,150	93,000	151,550	252,250	79,800	126,150	-13%	-14%	-17%
Total Daily Vehicle Trips	555,040	139,740	254,500	713,260	196,110	351,250	635,260	176,810	313,250	-11%	-10%	-11%
% Change (Existing & Option)												
Weekday	-			29%			14%					
Weeknight		-			40%			27%				
Weekend			-			38%			23%			

2. Hotels: Within the next eighteen (18) months at least an additional 460 hotel rooms in downtown Cleveland, will be available for occupancy per day. This represents nearly 40% of the rooms projected to be occupied in about 14% of the time.
3. Offices: Net absorption has increased by 400,000 square feet in the last 7 quarters - even after deducting the 280,000 square feet vacated by Eaton and the Ernst and Young building (East Bank) being added to the inventory. Furthermore, many of the recent office moves have reflected an emerging trend of accommodating the same and even more employees in less floor area.
4. While updated statistics have not been compiled, development and employment in the HTC appears to be maintaining a healthy pace.

In all cases, for the purposes of the traffic assessment, the weekday level of activity places the greatest demand on the roadways – generally, on infrequent peak occasions week-end is 90% of weekday activity. Additionally, the gap between weekday and weeknight/weekends is even greater than depicted on the summary tables because the frequency of nightly and weekend events occur on fewer occasions. For example, if the 10-12 occasions that First Energy Stadium is filled at or near capacity is eliminated from consideration, the weekend peak reduces to approximately 50% of the typical weekday activity. If other occasional events were also not considered, the disparity between week-day peaks and the week-end peaks would be greater.

Even the most optimistic evening or weekend projections (employees, hotel guests, visitors, residents) does not equal or surpass the average weekday peak – even if this level is assumed to occur daily.

In summary the consultant's estimates, to target year 2035, forecast:

1. Daily Activities to increase in the range of 21% (Option 2) to 32% (Option 1);
2. Vehicles in Use each day to increase in the range of 16% to 30%; and
3. Trip ends per day increasing in the range of 14% to 29%.

IV. Summary of Traffic Assessment (Traffic Engineers Report in *Appendix A*)

A. Methodology and Assumptions

When the ODOT study, related to the traffic assessment for the development of the Innerbelt, was completed increases in traffic volumes were assumed for the Innerbelt interchange locations. For example, The Burgess and Niple (B&N) forecast a 6% increase in “socio-economic” activity – in the twenty-five year period from 2000 to 2025. The “socio/economic” activity is the household and employment data that is incorporated into the NOACA traffic model and includes: new households, number of people per household, employees per household and increases in basic, service, and retail employment.

During the same period B&N’s forecast a 16% increase in daily “trip ends” in 2025 compared to 2000; yet, NOACA, which has updated its model to reflect a 2012 data base, has estimated that the trip ends in 2030 and 2035 will be essentially unchanged compared to 2012.

However, no increases in traffic volumes were forecast for the east–west or north–south roads in the Health Tech Corridor since the NOACA traffic model essentially assumed no increases in development activity either in the region or the Study Area. Our activity forecasts and resulting trip generation estimates – summarized earlier in this report – would suggest otherwise. Therefore, to reflect the anticipated increases in development activity and ____ traffic two (2) additional work steps were required.

1. Assigning the future traffic volumes to each of the traffic zones in the study area – both downtown and the HTC - based on the Option 1 development forecast (*Appendix C*). This was required in order for the NOACA traffic model to reflect the increased development activity.
2. Updating the existing traffic volumes at key intersections along the HTC which were selected by the Consultants.

The estimated increase in vehicle trips per day by 2035 assigned to each traffic zone (*Appendix C*) based on **Development Option 1**, were incorporated into the NOACA regional traffic model to generate the “traffic adjustment factor” (Exhibit 5) for key intersections along the major east west corridors which handle the preponderance of the traffic into and of the HTC. To establish daily trips, new traffic counts were undertaken in March 2013 at those key intersections for which NOACA did not have recent counts. These future traffic ratios are based on both the interchange plan as proposed by ODOT and Opportunity Corridor being completed which will absorb substantial amount of traffic away from the Innerbelt and the major east west corridors in the HTC. This is referred to as Traffic Scenario 2.

Adjustments were then made to redistribute the traffic based on the alternative interchange Scenarios – Traffic Scenario 1 reflecting the existing interchanges; and Traffic Scenario 3 reflecting the restoration of the Carnegie east bound exit ramp. For the ODOT proposal the NOACA model incorporates a 65% reduction in the eastbound traffic on Carnegie compared to current volumes. Therefore, for both Scenarios 1 and 3 a substantial amount of traffic have been essentially shifted back on to Carnegie, primarily from Chester.

Map 2A – Existing Interchanges

Map2B – ODOT’s Proposed Interchanges

Map 2C – Consultants Alternative

(To Be Added)

B. Capacity Assessment at Key Locations

Based on the increased traffic volumes, the Intersection Delay Comparison Analysis (**Exhibit 6**) determined that in several locations the Level of Service (LOS) decreased from acceptable C and D levels to unacceptable E and F.

The primary locations for the reduced LOS are at the extreme east and west ends of the HTC. This is not surprising since the two ends are the primary collection points for distribution of traffic into and out of the area. The regional system now collects, and will collect most of the traffic from essentially three general locations: (1) from the east, south, and west via I-77, I-71 and I-90 onto the Innerbelt and ultimately along the east/west streets; (2) via Opportunity Corridor in the future which will redistribute some of the traffic now using the routes in No. 1, or (3) to and from the north and east via main roads such as Martin Luther King Boulevard, Euclid, Cedar, etc.

However, the reduction in LOS, when volumes are projected to 2035, are more attributed to the proposed increased level of activity and “related traffic generation” within the corridor rather than being influenced by the alternative Traffic Scenarios. Additionally, the preponderance of the lowered LOS occurs on the north/south streets rather than the more major east/west corridors. For the most part, the north/south streets can accommodate less capacity but also have lower daily volumes.

The Consultants Traffic Engineer has stated that, while further study is needed to verify this conclusion, it’s anticipated that synchronization of signals and the addition of turning lanes on many of the north/south connecting streets will reduce delay and result in acceptable traffic management. It is further believed that the NOACA model has unrealistically reduced the future east bound trips on Carnegie (proposed reduction 65%) - which may not include adequate allowances for drivers to adjust driving patterns and continue to use Carnegie via the East 22nd Street ramp.

Exhibit 5

Ratio of Traffic Volume changes at Key Intersections

Immediate Innerbelt Area

Traffic adjustment factors 2012 to 2035 using the DB-Hartt economic estimates

NOACA Regional Model with Opportunity Blvd included in the 2035 Model network

Traffic adjustment factors from 2012 to 2035		
	Adjustment Factor	Comments
<u>1a. Cedar at E.22nd street</u>		
E.22nd From North	NA	Cedar and E.22nd are not connected in the 2035 network
E.22nd From South	NA	
Cedar Road From East	NA	
Cedar Road From West	NA	
<u>1b. E. 24th/Chester</u>		
E.24th From North	0.95	
Chester Ave. From East	1.95	
Chester Ave. From West	1.18	
<u>1c. E. 24th/Payne</u>		
E.24th From North	2.50	
E.24th From South	1.30	
Payne From East	2.50	
Payne From West	1.70	
<u>1d. E. 24th/Superior</u>		
E.24th From North	1.50	
E.24th From South	1.00	
Superior From East	1.55	
Superior From West	1.15	
<u>1e. E. 22nd/Prospect</u>		
E.22nd From South	1.40	
Prospect From East	1.35	
Prospect From West	1.15	
<u>1f. E. 22nd/Euclid</u>		
E.22nd From South	1.60	
Euclid Ave. From East	1.25	
Euclid Ave. From West	1.25	
<u>1g. E. 26th/Superior/IR-90</u>		
E.26th -IR-90 Ramp from North	0.42	
Superior Ave From East	0.75	
Superior Ave From West	1.10	

Exhibit 5 (continued)

E. 30th Corridor

Traffic adjustment factors 2012 to 2035 using the DB-Hartt economic estimates

NOACA Regional Model with Opportunity Blvd included in the 2035 Model network

		Traffic adjustment factors from 2012 to 2035	
		Adjustment Factor	Comments
<u>2a. E30th and Chester Av</u>			
E.30th From North	1.15		
E.30th From South	0.70		
Chester Ave From East	1.75		
Chester Ave From West	1.50		
<u>2b. E. 30th/Prospect Ave</u>			
E.30th From North	1.80	The Prospect Ave Interchange is not in the 2035 network	
E.30th From South	0.90		
Prospect Ave. From East	0.55		
Prospect Ave. From West	0.73		
<u>2c. E. 30th/Euclid Ave</u>			
E.30th From North	1.85		
E.30th From South	0.65		
Euclid Ave From East	1.75		
Euclid Ave From West	1.65		
<u>2d. E. 30th/Carnegie Ave</u>			
E.30th From North	1.40	Innerbelt Ramp to Carnegie is not included in the 2035 network	
E.30th From South	1.45		
Carnegie Ave From East	1.50		
Carnegie Ave From West	0.35		
<u>2e. E. 30th/Cedar Ave</u>			
E.30th From North	1.40	Heavy movement from Central EB to E.30th NB traffic from 22nd Ramp.	
E.30th From South	2.00		
Cedar Ave From East	1.45		
Cedar Ave From West	1.10		
<u>2f. E. 30th/Payne Ave</u>			
E.30th From North	1.10		
E.30th From South	2.20		
Payne Ave. From East	2.30		
Payne Ave. From West	1.60		
<u>2g. E. 30th/Superior Ave</u>			
E.30th From North	1.00		
E.30th From South	1.10		
Superior Ave. From East	0.85		
Superior Ave. From West	0.85		

Exhibit 5 (continued)

E. 55th Corridor

Traffic adjustment factors 2012 to 2035 using the DB-Hartt economic estimates

NOACA Regional Model with Opportunity Blvd included in the 2035 Model network

Traffic adjustment factors from 2012 to 2035	
Adjustment Factor	Comments
<u>3a. E55th and Chester Av</u>	
E.55th From North	1.10
E.55th From South	1.20
Chester Ave From East	1.20
Chester Ave From West	1.25
<u>3b. E. 55th/Euclid Ave</u>	
E.55th From North	1.25
E.55th From South	1.25
Euclid Ave From East	2.00
Euclid Ave From West	2.00
<u>3c. E. 55th/Carnegie Ave</u>	
E.55th From North	1.35
E.55th From South	1.65
Carnegie Ave From East	1.10
Carnegie Ave From West	0.75
Innerbelt Ramp to Carnegie is not included in the 2035 network	
<u>3d. E. 55th/Cedar Ave</u>	
E.55th From North	1.50
E.55th From South	1.50
Cedar Ave From East	1.60
Cedar Ave From West	1.60
<u>3e. E. 55th/Payne Ave</u>	
E.55th From North	1.15
E.55th From South	1.15
Payne Ave. From East	NA
Payne Ave. From West	1.10
T-Intersection	
<u>3f. E. 55th/Superior Ave</u>	
E.55th From North	1.00
E.55th From South	1.00
Superior Ave. From East	0.95
Superior Ave. From West	0.95

Exhibit 5 (continued)

E. 79th Corridor

Traffic adjustment factors 2012 to 2035 using the DB-Hartt economic estimates

NOACA Regional Model with Opportunity Blvd included in the 2035 Model network

Traffic adjustment factors from 2012 to 2035		
	Adjustment Factor	Comments
<u>4a. E.79th and Chester Av</u>		
E.79th From North	1.05	
E.79th From South	1.05	
Chester Ave From East	1.10	
Chester Ave From West	1.25	
<u>4b. E. 79th/Euclid Ave</u>		
E.79th From North	1.25	
E.79th From South	1.25	
Euclid Ave From East	1.20	
Euclid Ave From West	1.20	
<u>4c. E. 79th/Carnegie Ave</u>		
E.79th From North	1.20	Innerbelt Ramp to Carnegie is not included in the 2035 network
E.79th From South	1.20	
Carnegie Ave From East	1.15	
Carnegie Ave From West	0.75	
<u>4d. E. 79th/Cedar Ave</u>		
E.79th From North	1.30	
E.79th From South	1.20	
Cedar Ave From East	0.95	
Cedar Ave From West	0.95	

Exhibit 5 (continued)

E. 105th / Opportunity Corridor Area

Traffic adjustment factors 2012 to 2035 using the DB-Hartt economic estimates

NOACA Regional Model with Opportunity Blvd included in the 2035 Model network

	Traffic adjustment factors from 2012 to 2035	
	Adjustment Factor	Comments
<u>5a. E.105th and Chester Av</u>		
E.105th From North	1.70	The 2035 network includes Opportunity Blvd which connects with E.105 at Quincy Ave.
E.105th From South	1.70	
Chester Ave From East	1.20	
Chester Ave From West	1.05	

5b. E. 105th/Euclid Ave

E.105th From North	2.70	Heavy S-E turns because of Opportunity Blvd and its connection to IR-490/IR-77
E.105th From South	2.70	
Euclid Ave From East	1.50	
Euclid Ave From West	0.75	

5c. E. 105th/Carnegie Ave

E.105th From North	2.40	E.105th is Opportunity Blvd with connection to IR-490/IR-77
E.105th From South	2.40	
Carnegie Ave From East	1.30	
Carnegie Ave From West	1.25	

5d. E. 105th/Cedar Ave

E.105th From North	2.40	Heavy S-E turns because of Opportunity Blvd and its connection to IR-490/IR-77
E.105th From South	3.10	
Cedar Ave From East	1.65	
Cedar Ave From West	0.60	

EXHIBIT 6
Intersection Delay Comparison
Level of Service E and F

Existing	Scenario 1 Existing Interchange Projected 2035	Scenario 2 ODOT Configuration 2035	Scenario 2 ODOT Configuration 2025	Scenario 3 Consultants Alternative 2035
E. 24th/Superior	E. 24th/Superior	E. 24th/Superior	E. 24th/Superior	E. 24th/Superior
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 24th/Chester	E. 24th/Chester	E. 24th/Chester	E. 24th/Chester	E. 24th/Chester
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 22nd/Euclid	E. 22nd/Euclid	E. 22nd/Euclid	E. 22nd/Euclid	E. 22nd/Euclid
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 22nd/Prospect	E. 22nd/Prospect	E. 22nd/Prospect	E. 22nd/Prospect	E. 22nd/Prospect
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 26th/Superior	E. 26th/Superior	E. 26th/Superior	E. 26th/Superior	E. 26th/Superior
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 30th/Superior	E. 30th/Superior	E. 30th/Superior	E. 30th/Superior	E. 30th/Superior
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 30th/Payne	E. 30th/Payne	E. 30th/Payne	E. 30th/Payne	E. 30th/Payne
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB

Existing	Scenario 1 Existing Interchange Projected 2035	Scenario 2 ODOT Configuration 2035	Scenario 2 ODOT Configuration 2025	Scenario 3 Consultants Alternative 2035
E. 30th/Chester	E. 30th/Chester	E. 30th/Chester	E. 30th/Chester	E. 30th/Chester
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 30th/Euclid	E. 30th/Euclid	E. 30th/Euclid	E. 30th/Euclid	E. 30th/Euclid
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 30th/Prospect	E. 30th/Prospect	E. 30th/Prospect	E. 30th/Prospect	E. 30th/Prospect
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 30th/Carnegie	E. 30th/Carnegie	E. 30th/Carnegie	E. 30th/Carnegie	E. 30th/Carnegie
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 30th/Cedar	E. 30th/Cedar	E. 30th/Cedar	E. 30th/Cedar	E. 30th/Cedar
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 55th/Superior	E. 55th/Superior	E. 55th/Superior	E. 55th/Superior	E. 55th/Superior
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 55th/Payne	E. 55th/Payne	E. 55th/Payne	E. 55th/Payne	E. 55th/Payne
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 55th/Chester	E. 55th/Chester	E. 55th/Chester	E. 55th/Chester	E. 55th/Chester
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB

Existing	Scenario 1 Existing Interchange Projected 2035	Scenario 2 ODOT Configuration 2035	Scenario 2 ODOT Configuration 2025	Scenario 3 Consultants Alternative 2035
E. 55th/Euclid	E. 55th/Euclid	E. 55th/Euclid	E. 55th/Euclid	E. 55th/Euclid
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 55th/Carnegie	E. 55th/Carnegie	E. 55th/Carnegie	E. 55th/Carnegie	E. 55th/Carnegie
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 55th/Cedar	E. 55th/Cedar	E. 55th/Cedar	E. 55th/Cedar	E. 55th/Cedar
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 79th/Chester	E. 79th/Chester	E. 79th/Chester	E. 79th/Chester	E. 79th/Chester
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 79th/Euclid	E. 79th/Euclid	E. 79th/Euclid	E. 79th/Euclid	E. 79th/Euclid
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 79th/Carnegie	E. 79th/Carnegie	E. 79th/Carnegie	E. 79th/Carnegie	E. 79th/Carnegie
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 79th/Cedar	E. 79th/Cedar	E. 79th/Cedar	E. 79th/Cedar	E. 79th/Cedar
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 105th/Chester	E. 105th/Chester	E. 105th/Chester	E. 105th/Chester	E. 105th/Chester
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB

Existing	Scenario 1 Existing Interchange Projected 2035	Scenario 2 ODOT Configuration 2035	Scenario 2 ODOT Configuration 2025	Scenario 3 Consultants Alternative 2035
E. 105th/Euclid	E. 105th/Euclid	E. 105th/Euclid	E. 105th/Euclid	E. 105th/Euclid
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 105th/Carnegie	E. 105th/Carnegie	E. 105th/Carnegie	E. 105th/Carnegie	E. 105th/Carnegie
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB
E. 105th/Cedar	E. 105th/Cedar	E. 105th/Cedar	E. 105th/Cedar	E. 105th/Cedar
EB	EB	EB	EB	EB
WB	WB	WB	WB	WB
NB	NB	NB	NB	NB
SB	SB	SB	SB	SB

V. Economic Impacts

We have completed the following tasks in order to assess the potential economic outcomes associated with alternate ramp configuration scenarios in the study area:

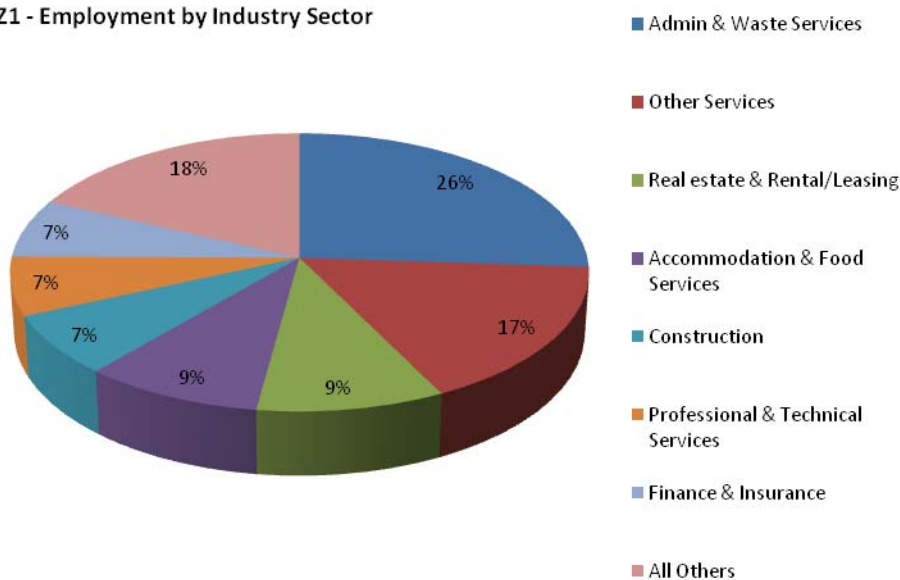
1. Define the study area and establish geographic subzones.
2. Define current conditions in the subzones, including employment by industry sector.
3. Project economic growth assuming steady state conditions.
4. Define and weight factors influencing economic development outcomes.
5. Score the weighted factors by subzone for the scenarios under consideration.
6. Project economic growth incorporating the weighted factor scores.
7. Compare potential outcomes.

Study Area – As defined previously in this report, the study area comprises all or portions of the Campus District, Midtown, and University Circle neighborhoods. We have divided the geography into six subzones to allow for a more granular approach to modeling the economic outcomes. These subzones are defined below:

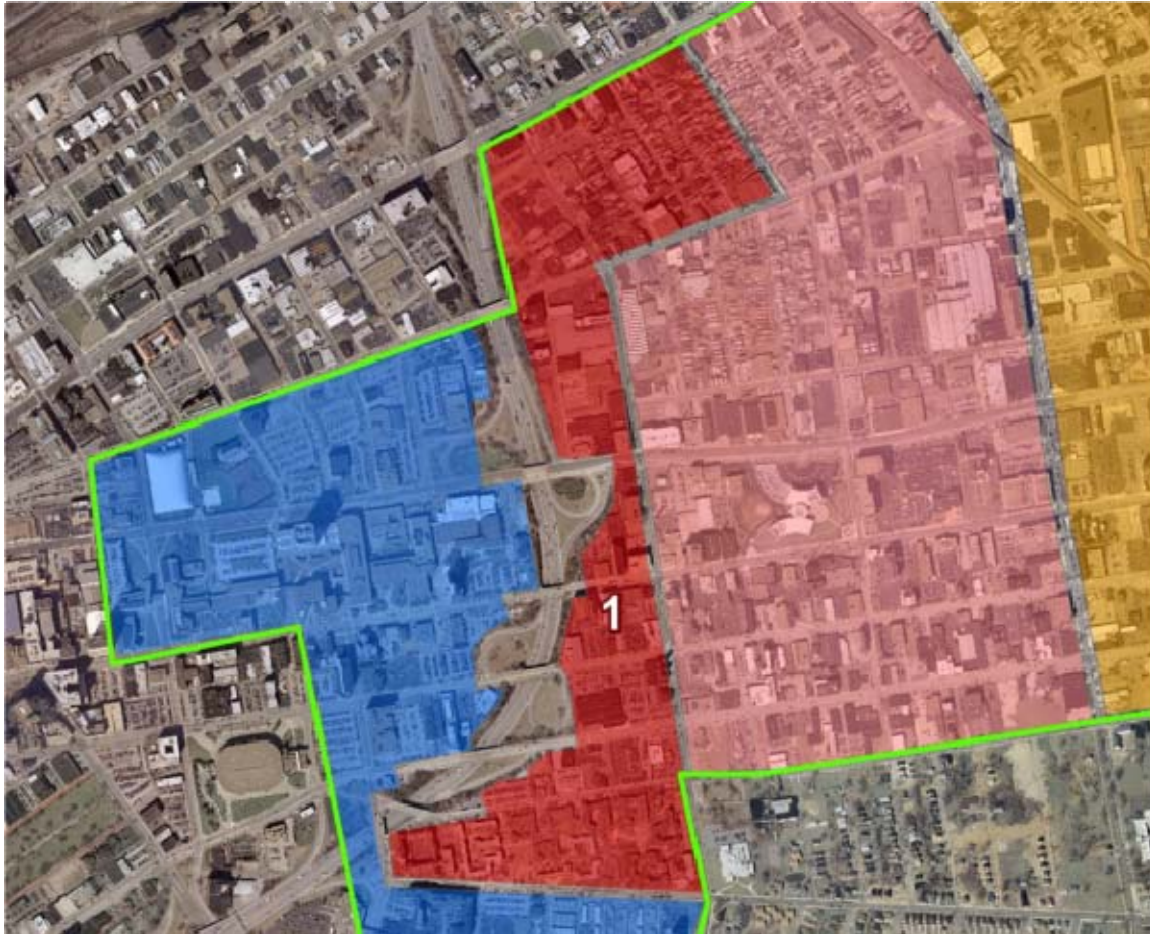
Subzone 1:

This subzone comprises an approximately 98 acre area bounded by the inner belt to the west and East 30th Street to the East. The southern end of the area extends to Central Avenue, and the northern boundary is defined by Superior Avenue. This subzone contains approximately 355 primarily commercial parcels and currently supports about 1,500 jobs. The chart below shows the distribution of those jobs in two-digit NAICS sectors:

SZ1 - Employment by Industry Sector



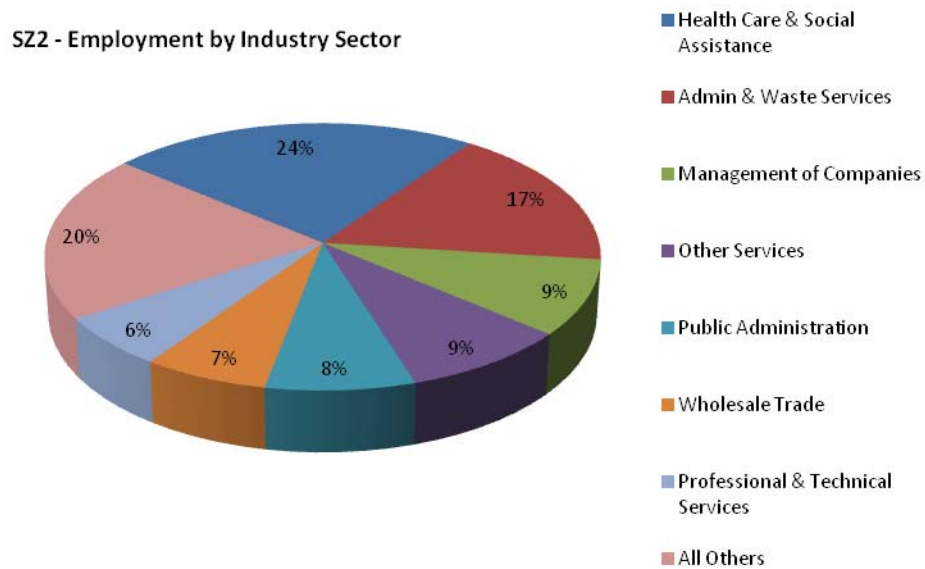
The graphic below shows the area comprising subzone 1:



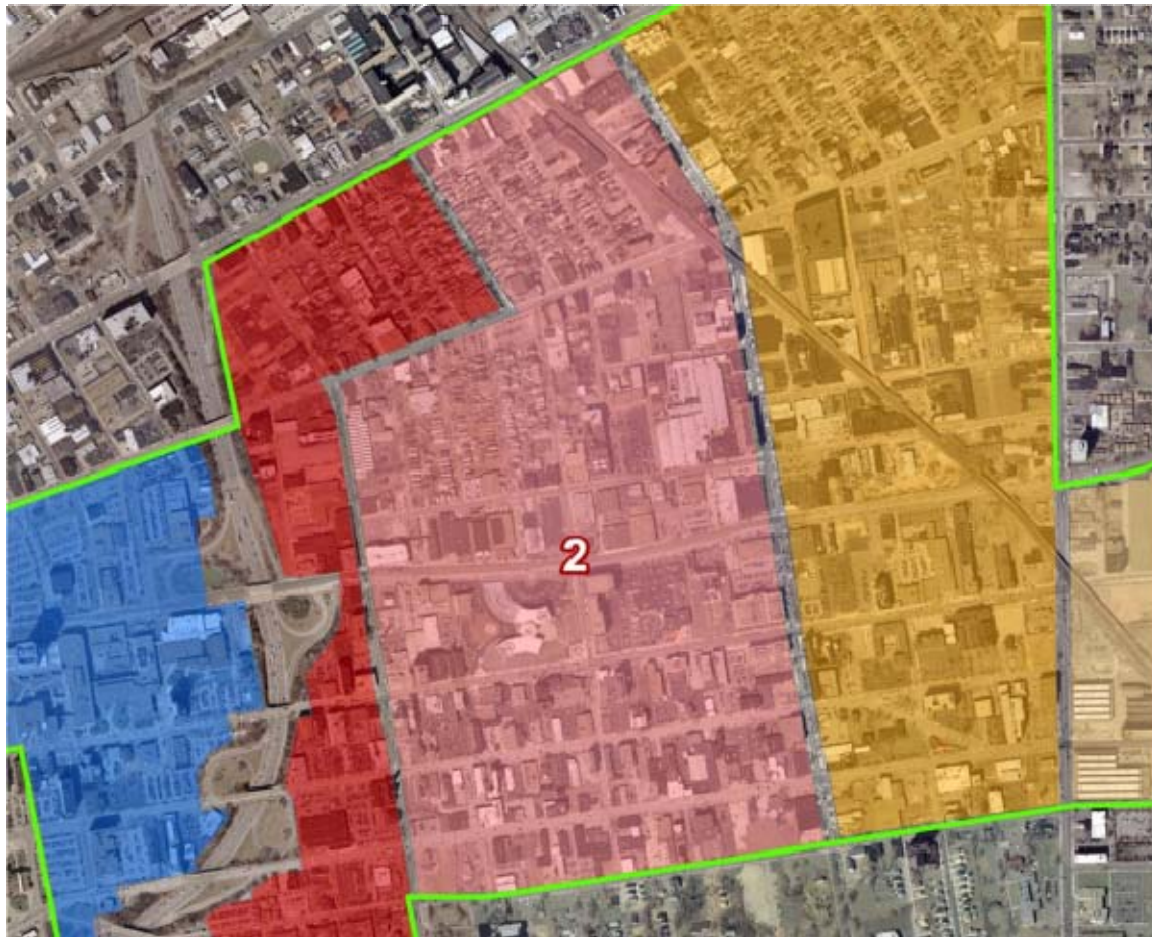
Subzone 1	
•Parcels:	355
•Acres:	98
•Commercial SF:	1,736,000
•Residential SF:	218,000
•Building Value:	\$55,133,000
•Land Value:	\$19,475,000
•Total Value:	\$74,609,000
•Total Employment:	1,500

Subzone 2:

This subzone comprises an approximately 215 acre area bounded by East 30th Street to the west and East 40th to the east. The southern end of the area extends to Cedar Avenue, and the northern boundary is defined by Superior Avenue. This subzone contains approximately 730 primarily commercial parcels and currently supports about 7,800 jobs. The chart below shows the distribution of those jobs in two-digit NAICS sectors:



The graphic below shows the area comprising subzone 2:

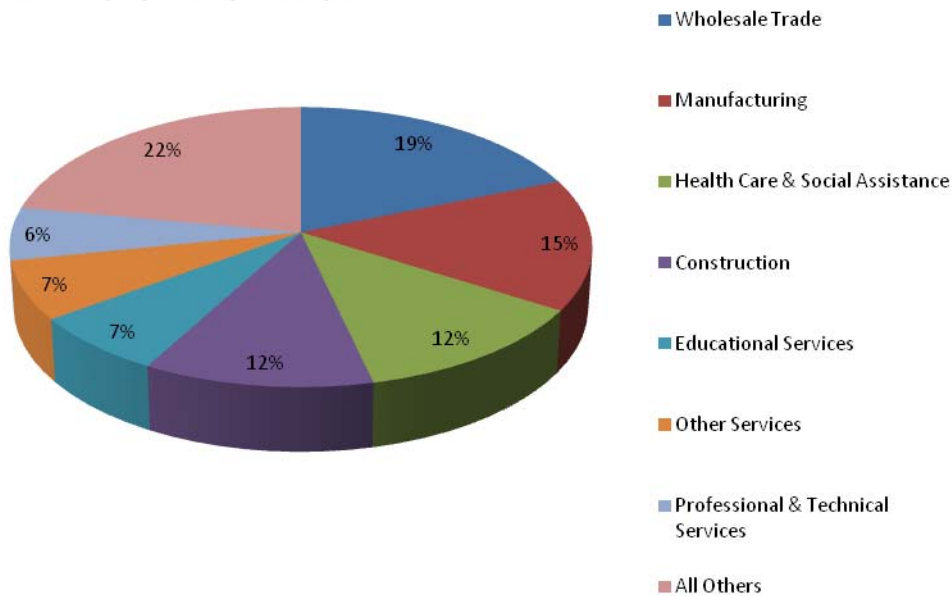


Subzone 2	
•Parcels:	734
•Acres:	215
•Commercial SF:	3,608,000
•Residential SF:	365,600
•Building Value:	\$126,567,000
•Land Value:	\$39,928,700
•Total Value:	\$166,496,000
•Total Employment:	7,800

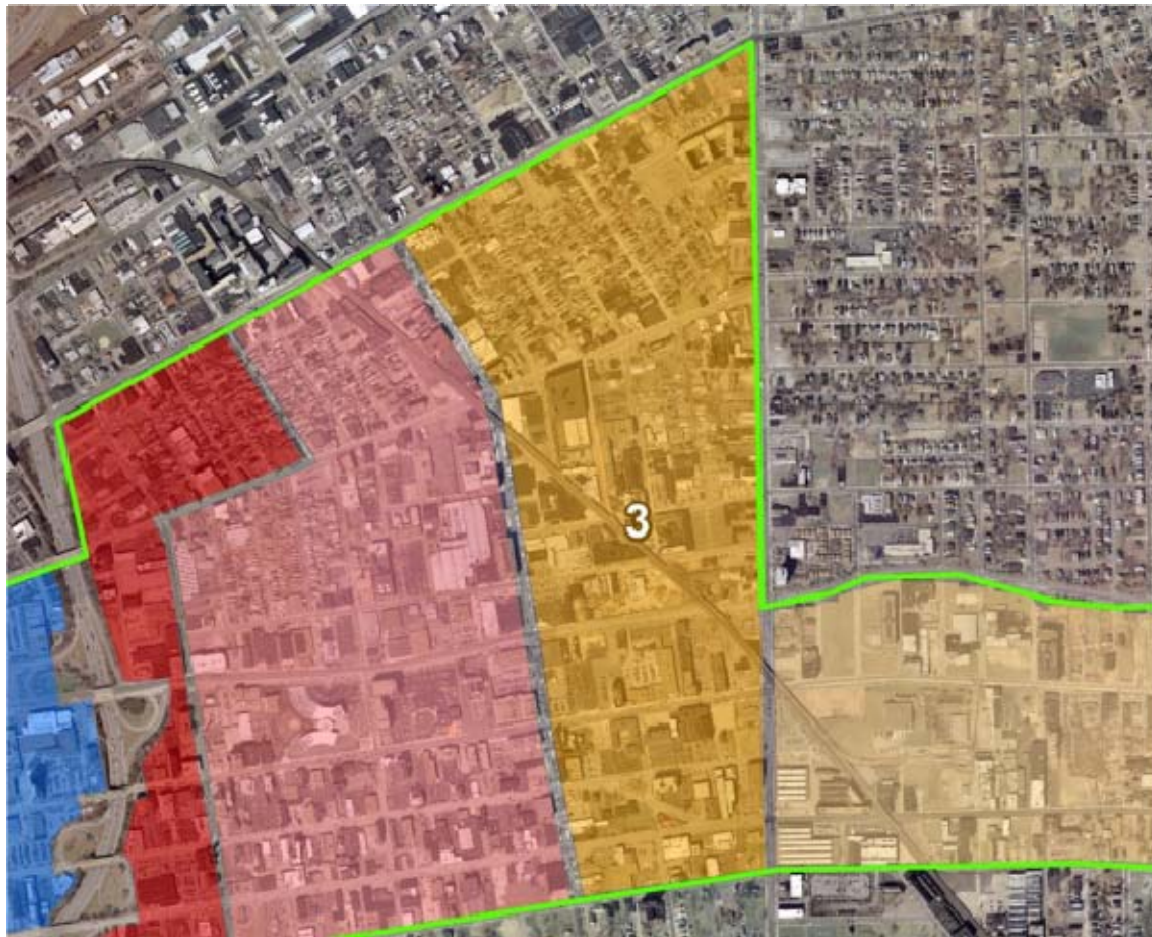
Subzone 3:

This subzone comprises an area of approximately 200 acres bounded by East 40th Street to the west and East 55th to the east. The southern end of the area extends to Cedar Avenue, and the northern boundary is defined by Superior Avenue. This subzone contains nearly 800 real estate parcels and currently supports about 2,500 jobs. The chart below shows the distribution of those jobs in two-digit NAICS sectors:

SZ3 - Employment by Industry Sector



The graphic below shows the area comprising subzone 3:

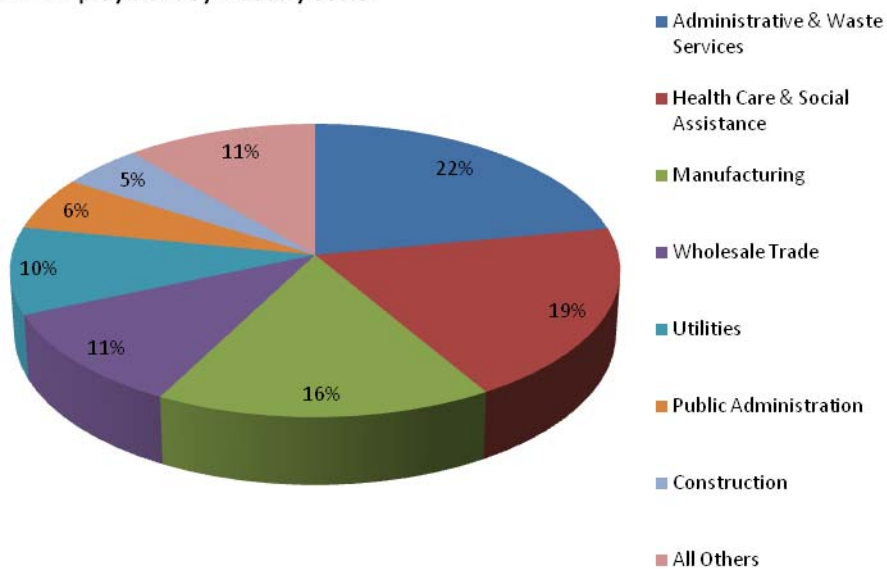


Subzone 3	
•Parcels:	797
•Acres:	199
•Commercial SF:	3,074,000
•Residential SF:	411,000
•Building Value:	\$60,850,000
•Land Value:	\$26,437,000
•Total Value:	\$87,287,000
•Total Employment:	2,500

Subzone 4:

This subzone is an area of approximately 200 acres bounded by East 55th Street to the west and East 79th to the east. The southern end of the area extends to Cedar Avenue, and the northern boundary is defined by Chester Avenue. This subzone contains nearly 450 real estate parcels and currently supports about 1,900 jobs. The chart below shows the distribution of those jobs in two-digit NAICS sectors:

SZ4 - Employment by Industry Sector



The graphic below shows the area comprising subzone 4:

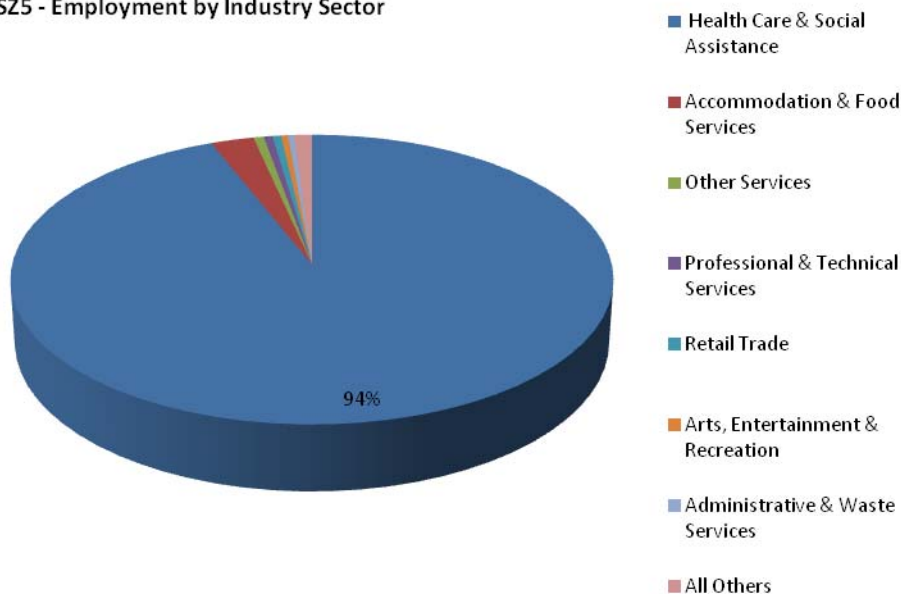


Subzone 4	
•Parcels:	449
•Acres:	201
•Commercial SF:	3,194,000
•Residential SF:	83,000
•Building Value:	\$55,079,000
•Land Value:	\$15,678,000
•Total Value:	\$70,757,000
•Total Employment:	1,900

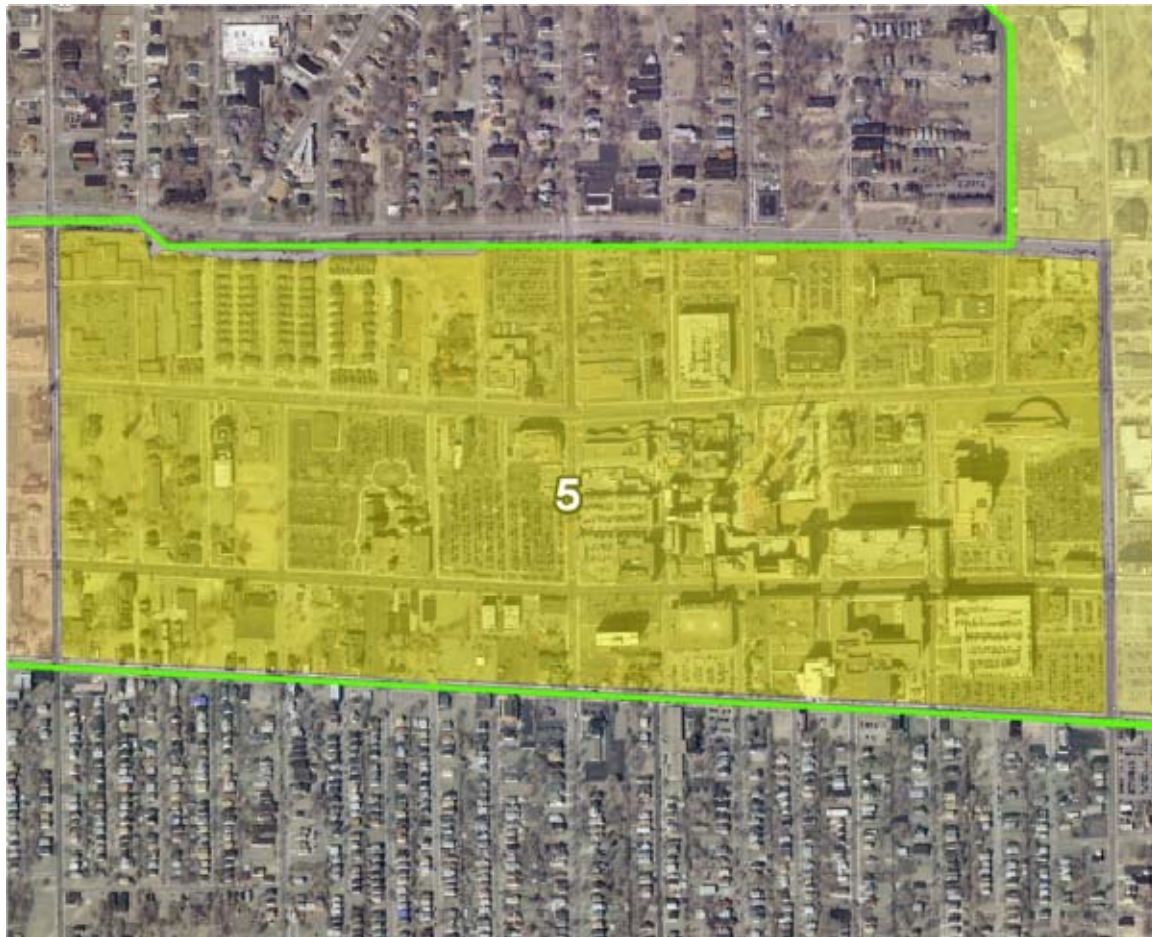
Subzone 5:

This subzone is an area of approximately 194 acres bounded by East 79th Street to the west and East 105th to the east. The southern end of the area extends to Cedar Avenue, and the northern boundary is defined by Chester Avenue. This subzone contains 444 parcels and currently supports about 30,000 jobs, almost all of which are Cleveland Clinic employees. The chart below shows the distribution of those jobs in two-digit NAICS sectors:

SZ5 - Employment by Industry Sector



The graphic below shows the area comprising subzone 5:



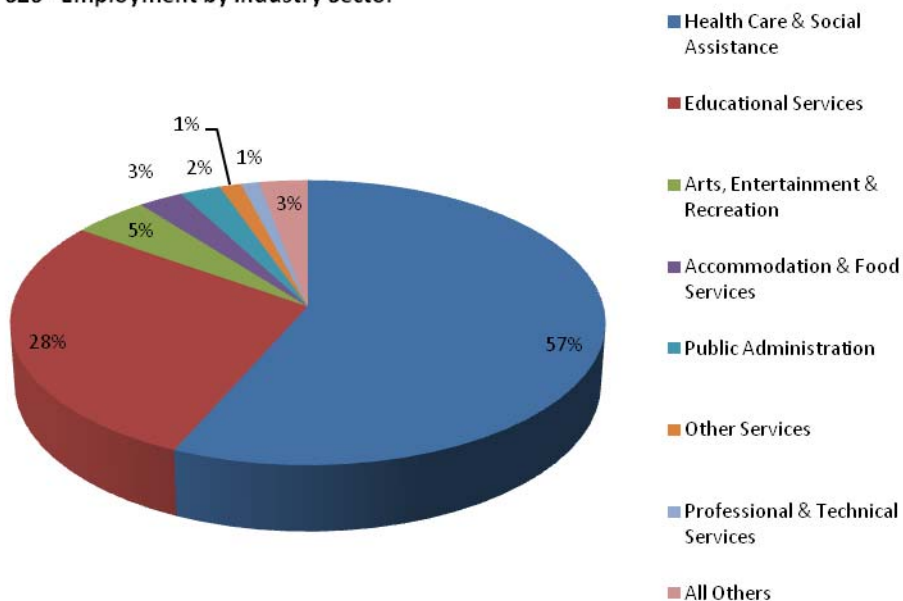
Subzone 5

- Parcels: 444
- Acres: 194
- Commercial SF: 10,482,000
- Residential SF: 382,000
- Building Value: \$1, 372,308,000
- Land Value: \$96,230,000
- Total Value: \$1,468,538,000
- Total Employment: 30,000

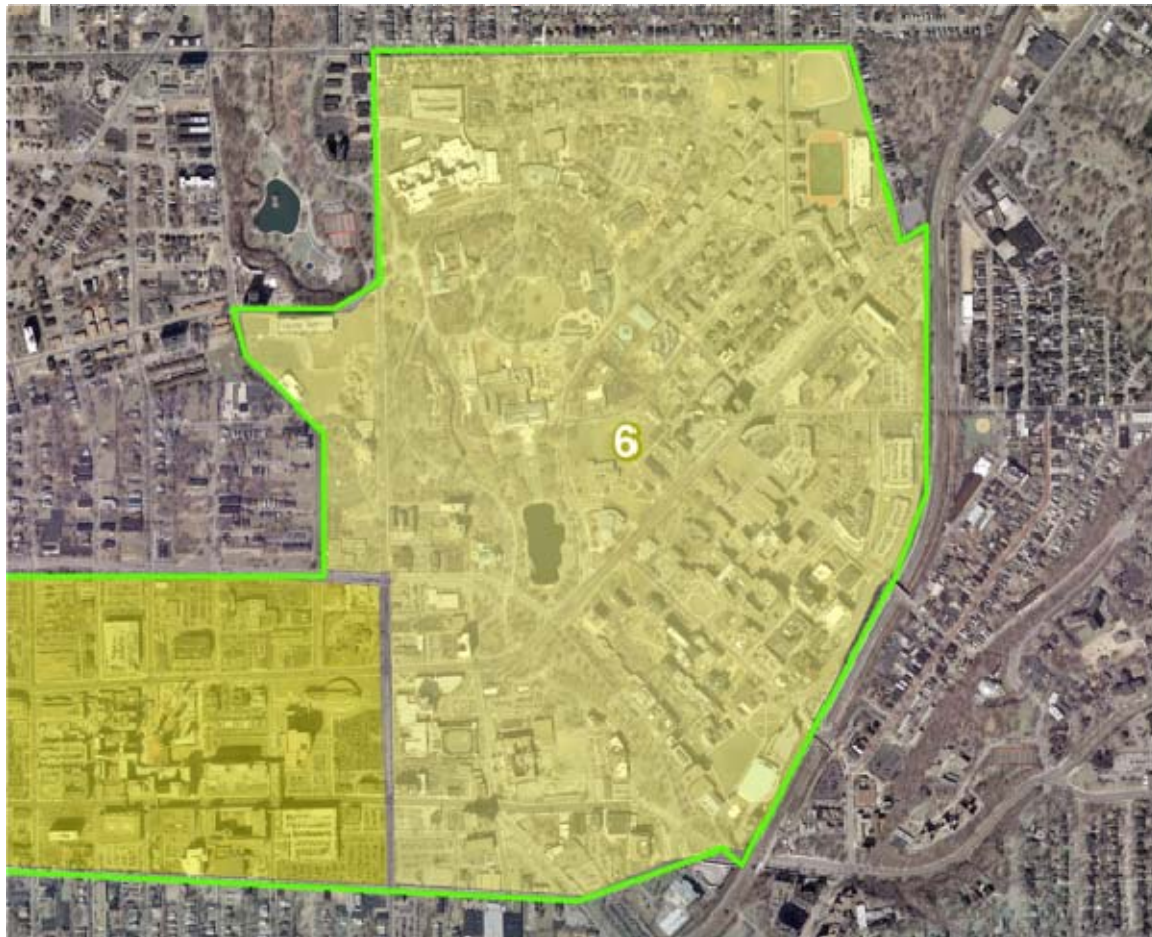
Subzone 6:

This subzone is an area of approximately 440 acres bounded by East 105th Street to the west and the rail system to the east. The southern end of the area extends to Cedar Avenue, and the northern boundary is defined by Wade Park Avenue. This subzone contains 575 real estate parcels, and currently supports about 34,000 jobs, many of which are University Hospitals and CWRU employees. The chart below shows the distribution of those jobs in two-digit NAICS sectors:

SZ6 - Employment by Industry Sector

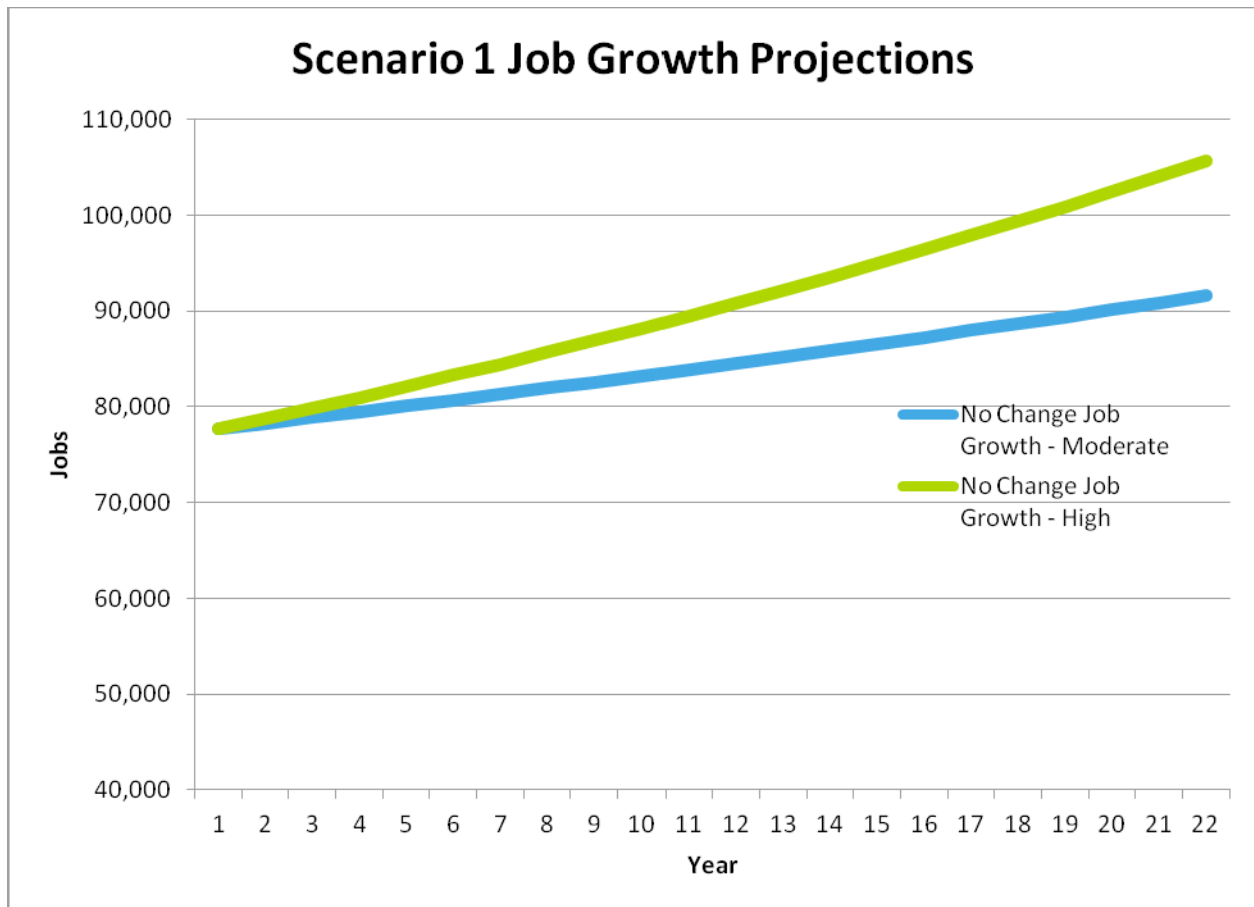


The graphic below shows the area comprising subzone 6:

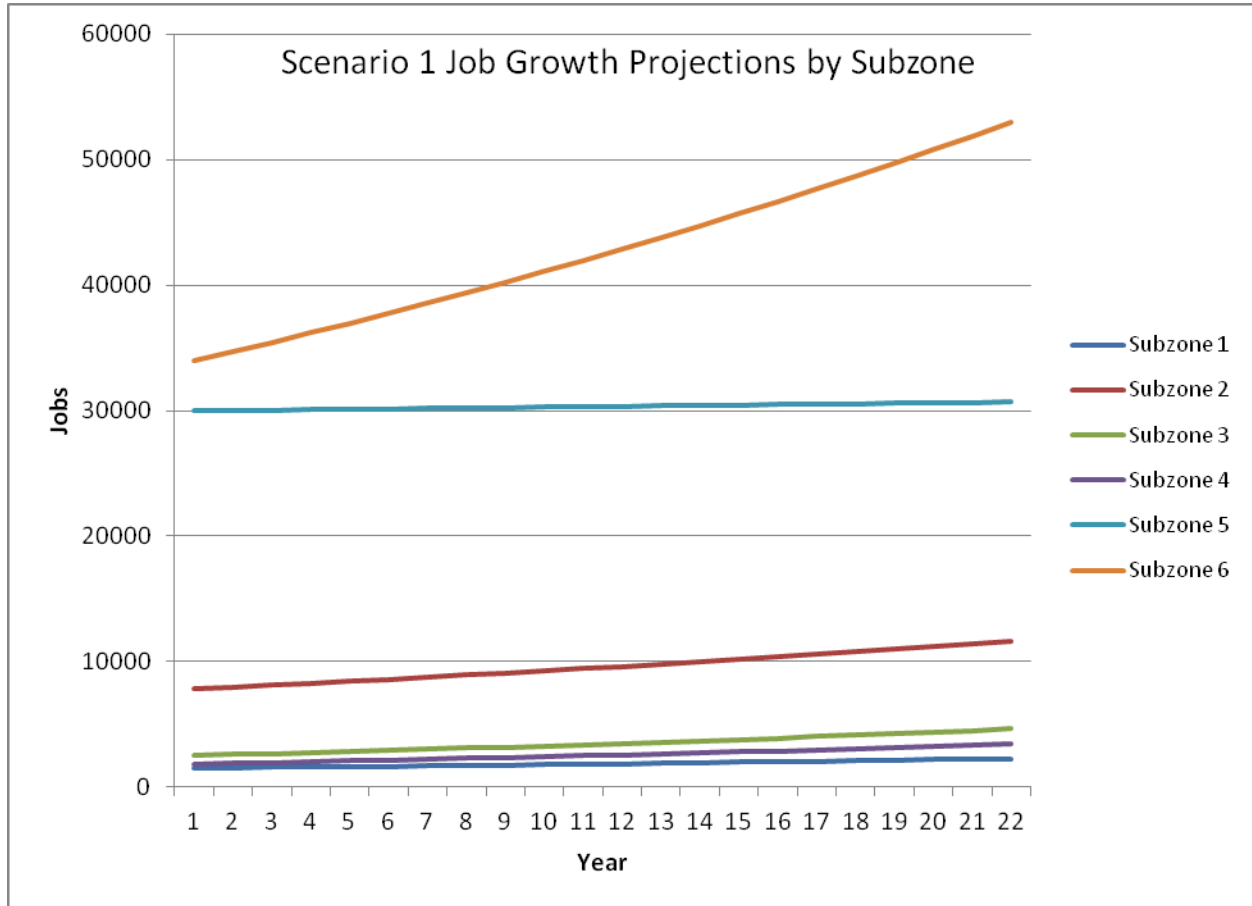


Subzone 6	
•Parcels:	575
•Acres:	439
•Commercial SF:	16,486,000
•Residential SF:	156,000
•Building Value:	\$1,375,978,000
•Land Value:	\$97,007,000
•Total Value:	\$1,472,985,000
•Total Employment:	34,000

Based on extensive interviews with major employers in the study area, a review of growth trends in the region and in a number of benchmark cities around the Midwest, and a review of planned investments and development projects, DB Hartt and Associates developed projections of employment growth in the study area over the study period of 22 years. The projection data may be found in tables XXXX, and are depicted in the graph below:



Using these growth projections, we have projected job growth by subzone, assuming no change in the inner belt ramps. These growth projections are shown in the graph below:



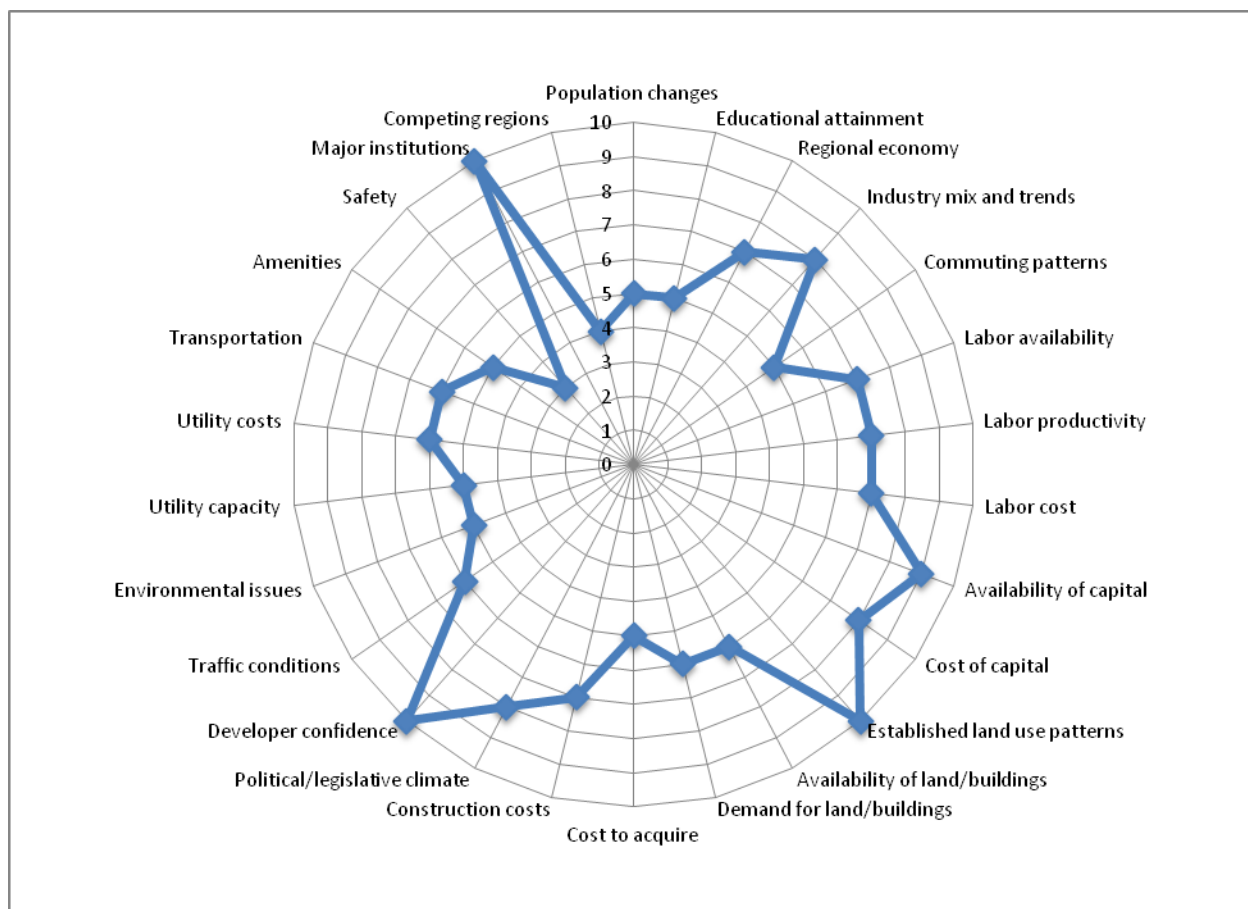
For each subzone, we also projected job growth by industry sector.

Little or no scholarly research exists related to the impact on development caused by changes in traffic patterns. This is probably due to the fact that there are simply too many other factors that have meaningful impacts within a study area, such that it is impossible to isolate the impacts only caused by the traffic shifts. With this mind, we have approached the problem of forecasting differences in potential development outcomes in the study area by weighting the likely impact of the various influencing factors.

These weights were developed based on interviews with experts in the fields of economic development and urban planning, and based on our own experiences both in the region and throughout the country. Many of these factors are largely exogenous to the system. In other words, these factors will not be changed or influenced, or will only slightly be changed or influenced, by other changes in the study area, including changes in traffic patterns. A summary of these factors and the weightings used is shown in the table below:

Factor	Weight (1-10)
Regional demographics	
Population changes	5

	Educational attainment	5
	Regional economy	7
	Industry mix and trends	8
	Labor market	
	Commuting patterns	5
	Labor availability	7
	Labor productivity	7
	Labor cost	7
	Access to capital	
	Availability of capital	9
	Cost of capital (interest rates)	8
	Real estate	
	Established land use patterns	10
	Availability of land/buildings	6
	Demand for land/buildings	6
	Cost to acquire	5
	Construction costs	7
	Political/legislative climate	8
	Developer confidence/willingness	10
	Traffic conditions	6
	Environmental issues	5
	Infrastructure	
	Utility capacity	5
	Utility costs	6
	Transportation (road, air, rail, water)	6
	Amenities	5
	Safety (crime, etc.)	3
	Major institutions	10
	Competing regions	4



The chart above provides a visual depiction of the relative weights of the factors, with the heavier weighted factors being plotted toward the outside of the circle.

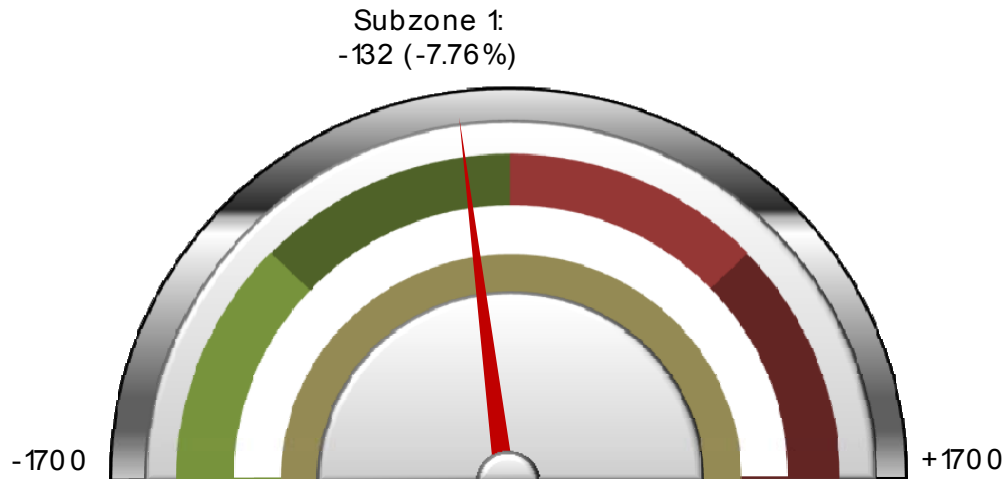
The weights were used within the following methodology. For each traffic scenario being considered, we assigned a score from -5 to +5 for each factor. These scores were then extended using the weights to generate an index factor (i.e., score x weight = index). We then calculated a possible spectrum of index scores. This involved determining the lower and upper bounds by calculating the index assuming all factors were scored at a -5 and then at a +5. These hypothetical scores were extended using the weights to generate the lower and upper bounds of the index, which in this case were -850 and +850, respectively. This means the spectrum of our weighted factor index has an absolute value of 1700, as depicted graphically below:



For each scenario under consideration, we then compared the calculated weighted index to the index spectrum in order to derive an adjustment factor to be used in projecting economic and fiscal activity over the study period.

For example, in considering traffic scenario 2 (“Scenario 2”), based on all of the interviews and information gathered throughout this project, we assigned a score to each factor based on the impact of the proposed inner belt ramp reconfiguration. As mentioned above, many of these factors will not be impacted by changes to the road system, so those factors were given a score of zero, to reflect no change between the steady-state scenario and Scenario 2. Those factors that would likely face some change were assigned a score on the scale of -5 to +5 depending on the projected impacts. This approach was repeated for each of the six designated subzones within the study area, which allowed us to score the potential impacts at a more narrow geographic level.

Each factor’s score was then extended using its weighting; the totals were generated and then used to calculate an impact index. Continuing with the example above, for Subzone 1, the impact index is a negative 7.76% for Scenario 2 as compared to the steady state, or no change scenario. The graphic below provides a visual representation of the index spectrum and the impact index value for Subzone 1, Scenario 2:



This number was then used as a modifier of projected employment growth rates within this subzone. The impact indexes for each of the subzones for Scenario 2 are as follows:

Subzone	Impact Index
1	-7.76%
2	-4.94%
3	-3.00%
4	-1.06%
5	0.00%
6	0.00%

In addition to the methodology outlined above, we made other adjustments to the calculations, where appropriate, based on information we received during the interview process. For example, we were informed by one major employer that if the ramp reconfiguration were to be undertaken, this company would relocate its employees outside of the study area. We accepted this statement as fact, and assumed those jobs would be eliminated early in the study period, and allowed for the possibility of replacement jobs over some time during the study period. We also included the expected negative effects that may occur during the construction period.

Assumptions affecting impacts:

Subzones 1 and 2 traffic conditions – There is very little difference in the expected outcomes under either scenario by 2035. Under Scenario 2, two shared intersections (30th/Chester and 30th/Prospect) are slightly less bad (one Level of Service) than under Scenario 1. This represents a minor improvement in service levels throughout these subzones, resulting in a score of +1 for this factor.

In these subzones (1 and 2), we also believe it is reasonable to expect that under Scenario 2, there may be some minor shift in the industry mix away from sectors such as manufacturing and distribution, and toward retail and other services. Even though the traffic analysis suggests little difference in overall levels of congestion during peak hours, Scenario 2 does result in fewer access points to the highway system and therefore potentially limits some amount of connectivity in the area. This may influence

factors such as commuting patterns, labor availability, and labor cost. The alternate ramp configuration may also negatively impact factors such as established land use patterns, demand for land/buildings, cost to acquire land/buildings, and developer/owner confidence, but could open up some land for development in subzone 1. The factor scoring for subzones 1 and 2 is summarized in the table below:

Factor	SZ1	SZ2
Industry mix and trends	-5	-3
Commuting patterns	-5	-3
Labor availability	-3	-1
Labor cost	-1	-1
Established land use patterns	-1	-1
Availability of land/buildings	+2	-1
Demand for land/buildings	-2	-1
Cost to acquire	-3	-1
Developer/owner confidence/willingness	-2	-1
Traffic conditions	+1	+1

Subzone 3 and 4 traffic conditions – Under Scenario 2, one shared intersection (55th/Carnegie) is somewhat worse than it is expected to be under Scenario 1, moving from a D to an F LOS. This represents a modest worsening of traffic conditions in these subzones leading to a score of -3 for this factor. The factor scoring for subzones 3 and 4 is summarized in the table below:

Factor	SZ3	SZ4
Industry mix and trends	-1	0
Commuting patterns	-1	0
Established land use patterns	-1	0
Developer/owner confidence/willingness	-1	0
Traffic conditions	-3	-3

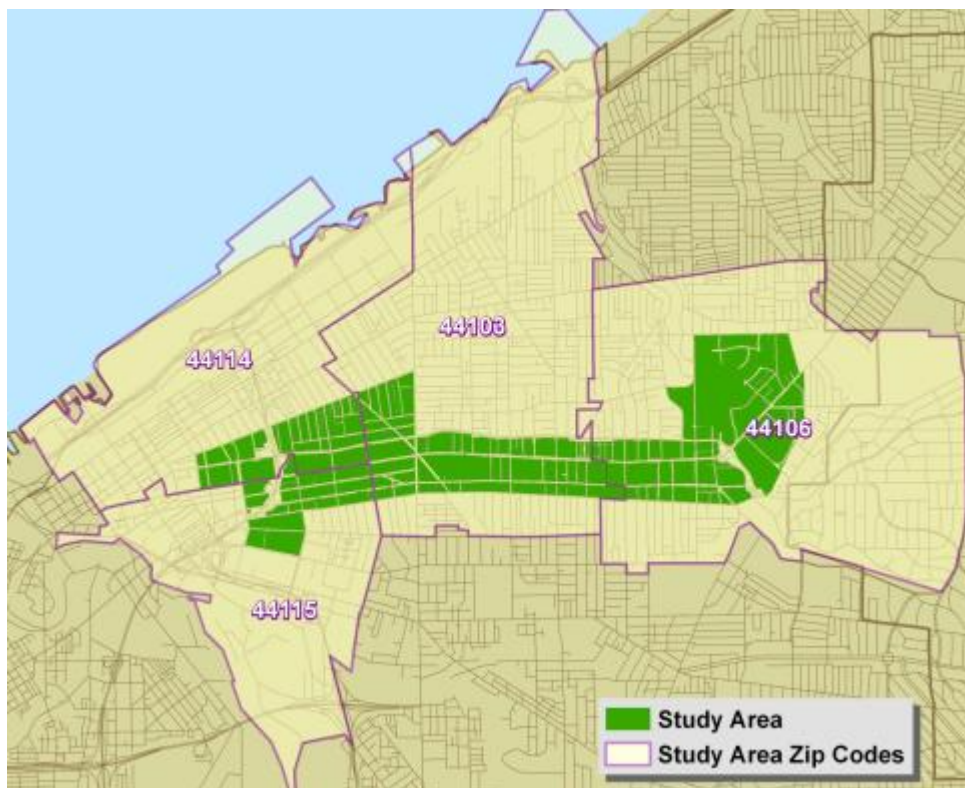
Subzones 5 and 6 traffic conditions – There is no difference between the Scenarios expected at any of the intersections in these subzones; therefore, the score of 0 was assigned for this factor. No other factors were changed under Scenario 2.

Of all of the influencing factors identified, the following were determined to be exogenous to the analysis. In other words, these factors are not directly affected by changes to transportation infrastructure within the relatively limited geography of the region. Therefore, all of the factors below were scored as 0's for all of the subzones.

Exogenous Factors
Population changes
Educational attainment
Regional economy
labor productivity

Availability of capital
Cost of capital (interest rates)
Construction costs
Political/legislative climate
Environmental issues
Utility capacity
Utility costs
Transportation (road, air, rail, water)
Amenities
Safety (crime, etc.)
Major institutions
Competing regions

In estimating the potential economic and fiscal outcomes associated with the scenarios under consideration, we have calculated direct impacts as those occurring within the study area; however, indirect impacts and fiscal impacts are modeled based on the region comprising the following four zip codes: 44114, 44115, 44103, and 44106, as shown in the graphic below.



Scenario 1 assumes no change in the Innerbelt configuration. We have prepared a high growth estimate of jobs in the study area (Option 1) and a lower growth estimate (Option 2) as described above. These

are defined as Option 1 and Option 2, respectively. We have projected direct economic and fiscal outcomes for each of these Options as follows:

Scenario 1	Year 1	Year 22 - Option 1	Year 22 - Option 2
Employment	77,700	105,700	91,600
Labor Income	\$4,286,000,000	\$5,837,000,000	\$5,065,000,000
Value Added	\$5,065,000,000	\$6,981,000,000	\$6,037,000,000
Fiscal Impact	\$396,338,000	\$566,628,000	\$484,972,000

Note that all of the scenarios and options we evaluated begin with the same starting Year 1 data. The data above presented in dollars represents estimated direct annual impacts. Labor Income refers to total wages and benefits earned by employees. Value Added is a measure of the total direct value of all goods and services produced in the study area. It is comparable to Gross Regional Product. Fiscal impacts include most state and local taxes and other fees, and Include direct and indirect impacts. All dollar values in this report are shown in 2013 dollars. Portions of this analysis were completed using the IMPLAN economic model. Information about IMPLAN may be found below on page 53.

The estimated direct outcomes for Scenario 2 are as follows:

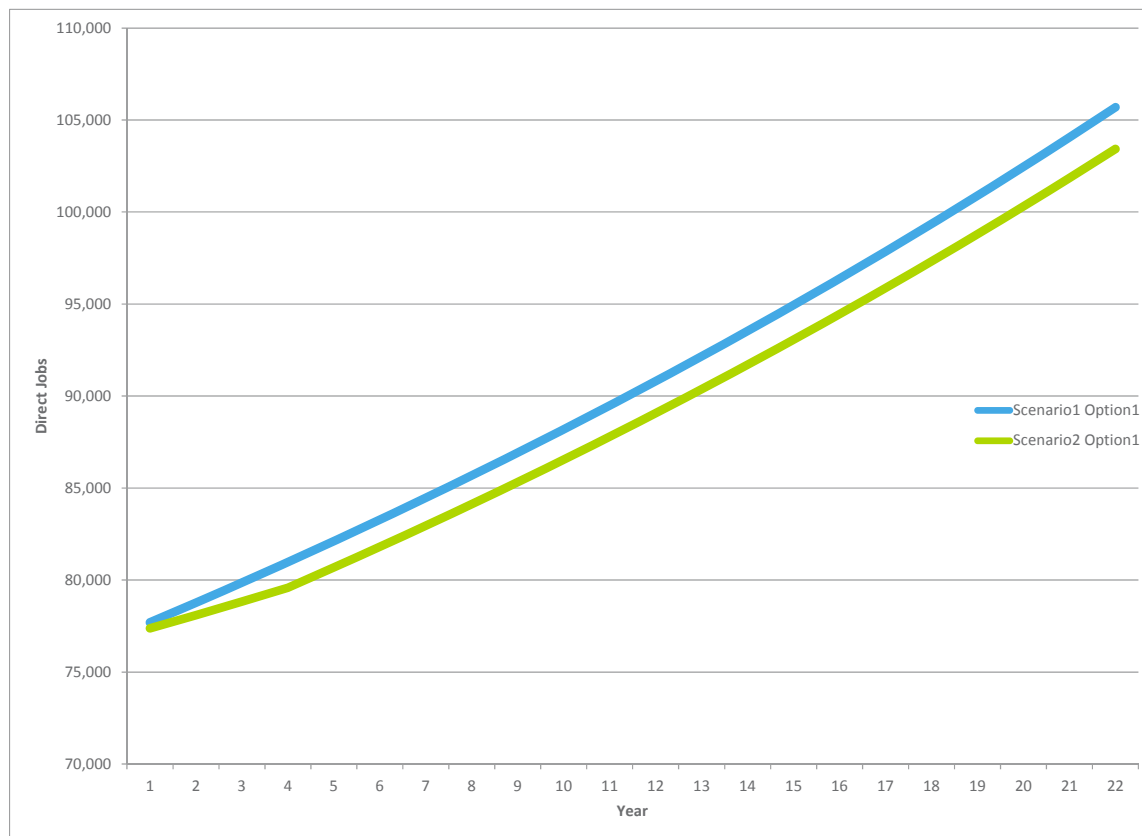
Scenario 2	Year1	Year 22 - Option 1	Year 22 - Option 2
Employment	77,700	103,400	90,100
Labor Income	\$4,286,000,000	\$5,672,000,000	\$4,948,000,000
Value Added	\$5,065,000,000	\$6,770,000,000	\$5,889,000,000
Fiscal Impact	\$396,338,000	\$547,732,000	\$472,021,000

The differences between scenarios are summarized in the table below:

	Scenario 1-Option 1 vs. Scenario 2-Option 1	Scenario 1-Option 1 vs. Scenario 2-Option 1 %	Scenario 1-Option 2 vs. Scenario 2-Option 2	Scenario 1-Option 2 vs. Scenario 2-Option 2 %
Employment	2,300	2.2%	1,500	1.6%
Labor Income	\$165,000,000	2.8%	\$117,000,000	2.3%
Value Added	\$211,000,000	3.0%	\$148,000,000	2.5%
Fiscal Impact	\$18,896,000	3.3%	\$12,951,000	2.7%

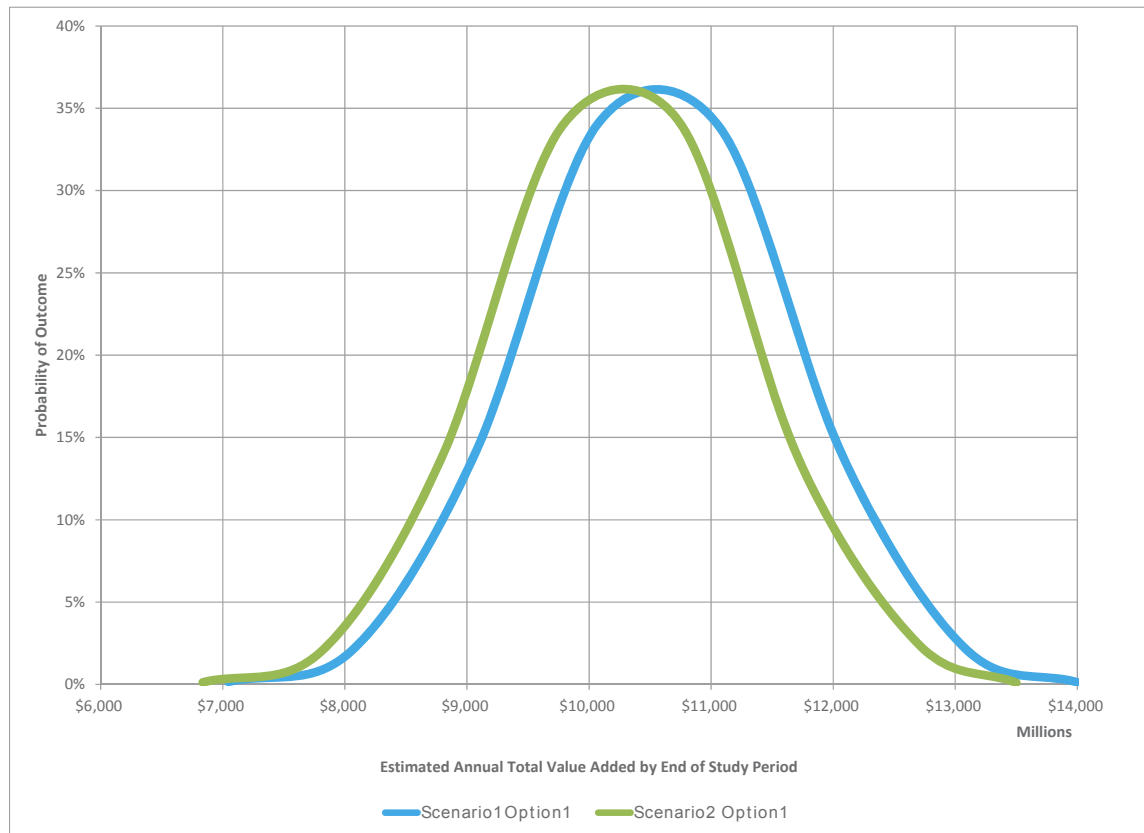
As shown above, the estimated difference in job growth in the study area by the end of the study period between Scenario 1 (no build) and Scenario 2 in the higher growth Option 1 is 2,300 fewer jobs in Scenario 2. This represents a difference of approximately 2.2%. The difference in direct labor income is approximately \$165 million less annually, or a little less than 3%. Value added is a measure of total economic activity. Under Scenario 2, the estimated difference in direct annual value added in the study area is approximately \$211 million less, or 3.0%. Finally, the estimated fiscal impacts are projected to be around \$19 million lower under Scenario 2, or 3.3%.

The difference in projected job growth in the study area under the two scenarios is shown in the graph below.



Due to the not inconsequential challenges associated with predicting the future, it may be more reasonable to consider a range of potential outcomes for each scenario and option. Assuming a normal distribution of potential outcomes and using our analysis to establish the mean, we have prepared the graphs below to demonstrate possible future, annual, total (direct and indirect) value added generated within the study region by year 22. This graph shows the probability of a range of potential outcomes. The horizontal axis presents annual total value added generated by the economic activity within the study region by the end of the study period. The vertical (y) axis shows the probability of each amount on the x-axis of value added being the outcome. In other words, in the graph below, the highest probability outcome for Scenario 1 Option 1 is approximately \$10 billion, and the likelihood of this outcome is approximately 35%. The normal distribution allows us to say with 95% confidence that the outcome for this scenario is likely to be between approximately \$8 billion and \$12 billion, or within two standard deviations of the mean.

It is evident in this graph that while the projected mean shifts slightly negative under Scenario 2 as compared to Scenario 1 (approximately 3%), there is still significant common area under each curve. This implies a high likelihood of common outcomes under either scenario.



About IMPLAN Economic Impact Analysis

Portions of this analysis were completed using the IMPLAN economic impact model. The IMPLAN model is used by more than 1,000 universities and government agencies to estimate the economic and fiscal impacts of investments and/or changes in industry, to forecast tax revenue and employment generation, and to conduct economic comparison studies of two or more geographic locations.

IMPLAN is an input-output model. Input-output accounting describes commodity flows from producers to intermediate and final consumers. The total industry purchases of commodities, services, employment compensation, value added, and imports are equal to the value of the commodities produced.

An IMPLAN impact analysis involves specifying a series of expenditures or other changes and applying them to the region's economic multipliers. The expenditures are identified in terms of the sectoring scheme for the model; in producer prices; and in historical dollars with the current year used as a base year. Only the dollars spent within the region are applied to the model.

The notion of a multiplier rests upon the difference between the initial effect of a change in final demand and the total effects of that change. Total effects can be calculated either as direct and indirect effects, or as direct, indirect, and induced effects. Direct effects are production changes associated with the immediate effects or final demand changes. Indirect effects are production changes in backward-linked industries caused by the changing input needs of directly affected industries (for example, additional purchases to produce additional output). Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects.

Purchases for final use (final demand) drive the model. Industries producing goods and services for final demand purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakage from the region (imports and value added) stops the cycle.

These indirect and induced effects (the effects of household spending) can be mathematically derived. The resulting sets of multipliers describe the change of output for each and every regional industry caused by a one-dollar change in final demand for any given industry.

Creating a regional input-output model requires a tremendous amount of data. The costs of surveying industries within each region to derive a list of commodity purchases (production functions) are prohibitive. IMPLAN was developed as a cost-effective means to develop regional input-output models. The IMPLAN accounts closely follow the accounting conventions used in the "Input-Output Study of the U.S. Economy" by the Bureau of Economic Analysis (1980) and the rectangular format recommended by the United Nations.

(Source for much of this description: Olson, Doug and Scott Lindall, "IMPLAN Professional Software, Analysis, and Data Guide"; Minnesota IMPLAN Group, Inc., 1725 Tower Drive West, Suite 140, Stillwater, MN 55082)

VI. Executive Summary

- A. Purpose of the Study:** The purpose of the study is to determine the extent of the differences in the economic impact within the Health Tech Corridor (HTC) by 2035 when considering three (3) alternative interchange configurations – the existing interchanges, ODOT’s proposed interchange plan, and the Consultants’ “compromise alternative” which retains the existing exit ramp directly from the Innerbelt to Carnegie east bound.

The merits and impacts of the redevelopment of the “trench portion” of the Innerbelt – from East 9th Street to the Shoreway – are outside the scope of this Study and have not been considered.

- B. Benchmarks for the Evaluation:** To establish the benchmarks for comparing the economic impacts of the alternative interchange configuration the Consultants estimated development and total activity levels for both the HTC and Downtown for the target year 2035. These estimates were derived from a variety of sources – documents, statistics, and interviews with stakeholders – for both Downtown and the HTC. These estimates were the basis for two (2) key analyses:

1. Projecting the daily trip generation estimates necessary to assess the potential changes in the Level of Service at key locations along the HTC. NOACA’s regional traffic model was used to determine the projected daily volumes compared to current volumes. The outcomes from the NOACA model in 2035 incorporate the ODOT proposed interchanges and the opening of the Opportunity Corridor.
2. Completing the economic assessments reflecting both the proposed volumes and the changes in the traffic patterns for the alternative interchange Scenarios.

C. Economic Findings

1. The Consultants believe that the development activity forecasts, while more optimistic than when the Innerbelt assessment was being undertaken, continue to be reasonable estimates for the next twenty-two (22) years given: recent trends; verification of those trends over the past year (since the forecasts were initially developed); the resurgence of interest in the urban lifestyle and development in Cleveland which mirrors trends in other communities.
2. The development estimates, and future daily traffic generation, contrast with NOACA’s forecast of essentially “no net gain” in the region and in the HTC by the target year 2035.
3. The projected changes in the Level of Service (LOS) along the key streets in the HTC are more related to the overall development activity expected and the resulting traffic generation rather than the interchange configuration. If the development and traffic generation forecasts do not materialize at the rate or in the timeline estimated in this report, the forecast reductions in the LOS will, likewise, not occur as quickly. However,

the converse is also true; if the rate of development happens more quickly the reduced LOS could occur sooner.

4. Regardless of the interchange configuration, the overall level of development activity in the HTC will not likely be materially altered because of the numerous variables that influence development and investment. Of the multiple location factors that affect investment and location decisions, most businesses, once the location decision has been made, will not likely be significantly influenced by road changes resulting in minor delays and increased travel time. Traffic is a minor overall consideration in making decisions, particularly in the urban environment. Typically, factors that are more important in the investment decision process include, but are not limited to:
 - a. Overall economic health and vibrancy of the area – investment breeds investment.
 - b. Established land use patterns, existing levels of development/investment, and the presence and activities of major institutions.
 - c. The economics of the potential development and the extent to which the cost of development or redevelopment is economically viable.
 - d. Market demand
5. All of the experts queried agreed that land use patterns generally dictate traffic patterns, not vice-versa. We do not believe it is reasonable to say that traffic and/or road infrastructure drives economic development. In fact, it is often the case that increasing road capacity to the point of eliminating all commuting delays has a negative impact on economic development in a region.
6. Based on all of the factors influencing development (and the Consultants weighting of these factors) the effect of ODOT's interchange proposal will likely have a maximum impact on the 2035 level of economic activity of no greater than three percent (3%). The weighting for traffic has been partially attributed to the actions or anticipated decisions expressed to the Consultants during the "conversational interviews" with HTC and Downtown stakeholders early in this process. Yet while traffic volumes, congestion and inconvenience may be an important consideration to some, these same traffic factors may be a less important consideration for others given the importance of other factors and the level of development occurring in more congested locations than Cleveland. Furthermore, based on the Consultants' experience, "any element of change" often receives disproportionate attention and perhaps negative reaction when the change is first proposed. Over time, however, adjustments are made and the "change" is generally accepted. Several stakeholders during the interviews, while expressing "grave concerns" regarding the revised traffic patterns, acknowledged that operating and/or marketing adjustments would be made. Additionally, there seems to be no reduction in the level of investment interest in the past year or so particularly given that the ODOT option continues to be "on the table" to be implemented. Presumably, when travel and "acceptability" adjustments are made over time HTC will continue as an important and acceptable location.

7. The estimated three percent (3%) impact is well within normal fluctuations and/or margins of error in the level of development that is expected to occur. Furthermore, non-traffic factors influencing investment and location decisions are also subject to “normal fluctuations” or variations in demand, perceptions, regional trends, growth/development of key facilities (hospitals, museums, and universities) and, over the development period (to 2035), are likely to have more influence than traffic considerations.
8. It is also the case in many thriving cities that traffic conditions have little or no measurable impact on the pace and type of development activity in neighborhoods, even those that do not have direct access to on/off ramps of major highways. Places like Chicago, Seattle, Washington D.C., Atlanta, Portland, and Denver have seen continuing significant reinvestment in high impact economic development projects supporting many high-wage jobs. This has happened and continues to occur despite significant traffic congestion at AM and PM peak hours. Thus there is empirical evidence that under any traffic outcome from a reconfiguration of the inner belt, development may or may not be impacted, and may be impacted in a positive or negative way. But the most likely outcome is that changes in traffic patterns will not result in significant, lasting differences in development outcomes, as these are likely to also be driven by the other factors offered in this report.

D Other Observations

1. The potential levels of activity for residential development and visitation to cultural and educational institutions and events is influenced by traffic congestion and inconvenience to a lesser extent than investment and location decisions related to new or expanded employment.
2. It is expected that retail uses may experience shifts in location, but retail is not expected to experience a reduction in overall market share. Even minor shifts in retail activity can be mitigated if, less traffic shifts from Carnegie to Chester than the NOACA model anticipates and customers adjust and use the north/south roads immediately east of the Innerbelt or use the E 22nd Street ramp to Carnegie in greater numbers.
3. The Consultants understand the importance of retaining connectivity between and among various elements in the City – whether, visual, functional, circulation (pedestrian, bicycle, or vehicular) yet find that such connectivity is not likely to be materially altered with the ODOT alternative. Any “inconvenience” because of reduced “connectivity” is not expected to result in any material impact on employment, visitors, and customers.

- E. Recommendation:** A study should be authorized by the City of Cleveland to determine to what extent traffic management changes are needed and can be accomplished to increase the Level of Service to acceptable levels throughout the corridor.

APPENDIX

- A. Traffic Engineer's Traffic Analysis Summary
- B. Development Estimates, with notes, by Area and Uses
 - Downtown Development Estimates – ***Exhibit B -1***
 - Downtown Vehicles in Use – ***Exhibit B -2***
 - Downtown Trips per Day – ***Exhibit B-3***
 - Health Tech Corridor Development Estimates – ***Exhibit B-4***
 - Health tech Corridor Vehicles in Use – ***Exhibit B-5***
 - Health Tech Corridor Trips per Day – ***Exhibit B-6***
- C. Estimated Vehicle Trips By Location of Origin (2035)
- D. Existing Development by Traffic Zone – County GIS, 2012
- E. Conversational Interviews Questionnaire

Appendix A

TRAFFIC ANALYSES SUMMARY

Methodology:

There are twenty-six (26) intersections in the study area that are considered to be critical in terms of capacity and queues. These intersections are expected to be directly affected by the proposed ramp changes and the associated redistribution of traffic. The intersections are as follows:

- | | |
|-----------------------------------|------------------------------------|
| 1. E. 24 th /Chester | 14. E. 55 th /Euclid |
| 2. E. 24 th /Superior | 15. E. 55 th /Carnegie |
| 3. E. 22 nd /Prospect | 16. E. 55 th /Cedar |
| 4. E. 22 nd /Euclid | 17. E. 55 th /Payne |
| 5. E. 26 th /Superior | 18. E. 55 th /Superior |
| 6. E. 30 th /Chester | 19. E. 79 th /Cedar |
| 7. E. 30 th /Prospect | 20. E. 79 th /Carnegie |
| 8. E. 30 th /Euclid | 21. E. 79 th /Euclid |
| 9. E. 30 th /Carnegie | 22. E. 79 th /Chester |
| 10. E. 30 th /Cedar | 23. E. 105 th /Cedar |
| 11. E. 30 th /Payne | 24. E. 105 th /Carnegie |
| 12. E. 30 th /Superior | 25. E. 105 th /Euclid |
| 13. E. 55 th /Chester | 26. E. 105 th /Chester |

Existing traffic count data for the intersections was gathered through various sources and approved for use by the Ohio Department of Transportation. These sources include: Certified Traffic Plates developed by Burgess and Niple for the Cleveland Innerbelt Study, existing traffic counts used by Baker in the MidTown TLCl, and existing traffic counts taken by CT Consultants for this study.

The economic data was submitted to NOACA so that 2035 traffic growth rate projections could be calculated using the NOACA area-wide traffic model. The model projected growth rates on the approaches for each of the intersections listed above. The 2035 projected traffic is considered to be the high estimate forecast scenario or Option 1. This option includes the proposed Innerbelt ramp reconfiguration.

A 2025 projected traffic estimate was attained by using the midpoint traffic projection between the 2035 estimate and the existing count data. The 2025 projected traffic is considered to be the medium estimate forecast scenario or Option 2. This option includes the proposed Innerbelt ramp reconfiguration. A third option, Alternate 3, was proposed by MidTown which included retaining the northbound I-90 Carnegie off-ramp. This option was analyzed for the 2035 data.

Capacity Analysis

The capacity of an intersection is represented by a Level of Service (LOS). Level of Service (LOS) is a measure of how well an intersection operates under a given traffic load. It is defined by the delay that a driver experiences and is graded by letters from A through F (best to worst) as defined in terms of average vehicle delay. The Ohio Department of Transportation defines a LOS D or better as acceptable in an urban environment.

Table 1 shows the definitions of Level of Service (LOS) for signalized intersections:

Table 1. Level of Service Definitions – Intersections

LOS	Description	Signalized Delay/Vehicle (SEC)
A	Free flow, low volume, high speed	≤ 10.0
B	Stable flow, speeds somewhat restricted by traffic conditions	10.1 – 20.0
C	Stable flow, but more restricted	21.1 – 35.0
D	Restricted flow, little maneuvering possible	35.1 – 55.0
E	Unstable flow, short stoppages develop	55.1 – 80.0
F	Forced flow, breakdown	> 80.0

Each intersection was analyzed with respect to capacity using the most recent version of the Highway Capacity Software (HCS2010). The intersections were analyzed for the Existing PM

peak hour of traffic, the 2025 PM peak hour of traffic, and the 2035 PM peak hour of traffic. The PM peak hour of traffic was utilized due to the fact that the highest volumes of traffic occurred during this time period.

Table 2 summarizes the *Existing* Levels of Service (LOS) and delay per vehicle for the intersections studied. The table shows both the individual approaches to the intersections and the overall intersections.

Table 2. Level of Service / Delay Summary
PM Peak Hour – Existing

<u>Capacity Analysis per Intersection - Existing</u>						
#	Intersection	Approach	Level of Service (LOS)	Delay (Secs/Veh)	LOS Overall Intersection	Delay Overall Intersection
1	24/Chester	EB	A	5.4	B	11
		WB	A	8.3		
		NB	-	-		
		SB	D	41.5		
2	24/Superior	EB	A	4	A	8
		WB	A	3.8		
		NB	D	40.1		
		SB	D	43.8		
3	22/Prospect	EB	A	8	C	21.9
		WB	A	6.1		
		NB	D	39.6		
		SB	-	-		
4	22/Euclid	EB	C	25.2	F	104.8
		WB	A	8.4		
		NB	F	311.5		
		SB	-	-		
5	26/Superior	EB	C	23	C	27.9
		WB	C	20.9		
		NB	-	-		
		SB	D	48.4		
6	30/Chester	EB	C	23.2	D	35.6
		WB	C	23.7		
		NB	F	106.2		
		SB	E	55.4		
7	30/Prospect	EB	B	16.7	C	22.9
		WB	C	20.1		
		NB	C	26.7		
		SB	C	29		

<u>Capacity Analysis per Intersection - Existing</u>						
8	30/Euclid	EB	B	10.4	C	23.8
		WB	B	12.8		
		NB	C	28.5		
		SB	D	37.4		
9	30/Carnegie	EB	B	19	C	23.9
		WB	B	12.4		
		NB	C	30.9		
		SB	D	41.7		
10	30/Cedar	EB	A	9.2	C	33.6
		WB	B	10.3		
		NB	D	40.9		
		SB	D	49.8		
11	30/Payne	EB	A	8.4	B	17.4
		WB	A	8		
		NB	C	24		
		SB	C	26.5		
12	30/Superior	EB	A	7.6	B	17.1
		WB	A	7.4		
		NB	D	45.2		
		SB	C	31.7		
13	55/Chester	EB	C	22.3	C	31.9
		WB	B	18.7		
		NB	D	43.2		
		SB	E	59.6		
14	55/Euclid	EB	B	19.1	C	26.1
		WB	B	11.9		
		NB	C	30.6		
		SB	C	32.3		
15	55/Carnegie	EB	B	17.9	C	26.8
		WB	C	29.6		
		NB	C	29.7		
		SB	C	31.3		
16	55/Cedar	EB	B	14.5	C	32
		WB	B	15.2		
		NB	C	28.6		
		SB	D	37.8		
17	55/Payne	EB	D	39.1	B	10.9
		WB	-	-		
		NB	A	5.1		
		SB	A	4.8		

<u>Capacity Analysis per Intersection - Existing</u>						
18	55/Superior	EB	C	23.9	C	33.4
		WB	D	38.1		
		NB	D	38.3		
		SB	C	30.9		
19	79/Cedar	EB	A	5.7	B	19.5
		WB	A	5.8		
		NB	D	47.3		
		SB	D	47.5		
20	79/Carnegie	EB	A	9.5	B	17.1
		WB	B	13.2		
		NB	D	38		
		SB	D	47.4		
21	79/Euclid	EB	C	22.1	C	34.7
		WB	C	21.4		
		NB	D	43.4		
		SB	D	49		
22	79/Chester	EB	B	15.1	C	25.8
		WB	B	13.9		
		NB	E	56.3		
		SB	F	80.4		
23	105/Cedar	EB	D	41.8	B	16
		WB	-	-		
		NB	A	5.7		
		SB	A	7.1		
24	105/Carnegie	EB	C	23.7	C	23.9
		WB	B	17.2		
		NB	C	32		
		SB	C	30.1		
25	105/Euclid	EB	B	16.2	C	30.2
		WB	B	15.6		
		NB	D	39.2		
		SB	D	38.2		
26	105/Chester	EB	C	24.7	C	26.2
		WB	C	20.1		
		NB	C	30.5		
		SB	D	37.7		

According to the capacity analysis, the intersections of 22nd and Euclid, 30th and Chester, 55th and Chester, and 79th and Chester presently function at an unacceptable Level of Service.

Table 3 summarizes the 2025 Levels of Service (LOS) and delay per vehicle for the intersections studied. The table shows both the individual approaches to the intersections and the overall intersections.

Table 3. Level of Service / Delay Summary
PM Peak Hour – 2025 (Medium Estimate Forecast)

Capacity Analysis Summary per Intersection - 2025						
#	Intersection	Approach	Level of Service (LOS)	Delay (Secs/Veh)	LOS Overall Intersection	Delay Overall Intersection
1	24/Chester	EB	A	6.4	B	11.3
		WB	A	9.5		
		NB		-		
		SB	D	41.5		
2	24/Superior	EB	A	5.1	A	8.8
		WB	A	4.9		
		NB	D	37.7		
		SB	D	42.5		
3	22/Prospect	EB	A	9.9	C	24
		WB	A	7.4		
		NB	D	40.8		
		SB		-		
4	22/Euclid	EB	C	34	F	178.1
		WB	A	9.3		
		NB	F	496.9		
		SB		-		
5	26/Superior	EB	B	17.7	C	21.2
		WB	B	12.3		
		NB		-		
		SB	D	45		
6	30/Chester	EB	D	30.9	D	45.7
		WB	D	46.7		
		NB	F	94.8		
		SB	E	56.7		
7	30/Prospect	EB	B	18.2	D	40.3
		WB	C	20.8		
		NB	E	66.8		
		SB	D	54		
8	30/Euclid	EB	B	13.5	D	36.4
		WB	B	18.9		
		NB	C	26.2		
		SB	E	65.7		

<u>Capacity Analysis Summary per Intersection - 2025</u>						
9	30/Carnegie	EB	B	15.8	C	29
		WB	B	13.7		
		NB	C	33.2		
		SB	E	58.3		
10	30/Cedar	EB	A	9.3	F	83.4
		WB	B	10.7		
		NB	F	135.5		
		SB	F	91.5		
11	30/Payne	EB	B	12.8	B	17.6
		WB	B	14.1		
		NB	C	22		
		SB	C	21.9		
12	30/Superior	EB	A	7.5	B	18.3
		WB	A	7.3		
		NB	D	48.2		
		SB	C	31.7		
13	55/Chester	EB	C	26.4	C	34.9
		WB	C	21.2		
		NB	D	44.1		
		SB	E	65.2		
14	55/Euclid	EB	C	29	C	26.2
		WB	B	16.4		
		NB	C	28.3		
		SB	C	30.9		
15	55/Carnegie	EB	B	17.3	C	29.3
		WB	C	27.9		
		NB	D	37.2		
		SB	D	35.7		
16	55/Cedar	EB	B	19.5	C	32.1
		WB	C	20.8		
		NB	C	24.2		
		SB	D	39.3		
17	55/Payne	EB	D	38.8	B	11.1
		WB		-		
		NB	A	5.6		
		SB	A	5.1		
18	55/Superior	EB	C	23.5	C	33.2
		WB	D	37.2		
		NB	D	38.3		
		SB	C	30.9		

<u>Capacity Analysis Summary per Intersection - 2025</u>						
19	79/Cedar	EB	A	2.3	B	17.3
		WB	A	2.3		
		NB	D	43.9		
		SB	D	43.5		
20	79/Carnegie	EB	B	10	B	19.9
		WB	B	16.7		
		NB	D	37.7		
		SB	D	49.6		
21	79/Euclid	EB	C	23.8	D	37.3
		WB	C	24.2		
		NB	D	44.9		
		SB	D	52		
22	79/Chester	EB	B	16	C	28.8
		WB	B	14.3		
		NB	E	60.3		
		SB	F	108.3		
23	105/Cedar	EB	D	43.4	B	14.7
		WB		-		
		NB	A	7.9		
		SB	B	11.7		
24	105/Carnegie	EB	D	40.8	F	81.1
		WB	C	25.3		
		NB	F	189.7		
		SB	F	130.6		
25	105/Euclid	EB	C	28.5	D	37.1
		WB	C	28		
		NB	D	44.6		
		SB	C	34.8		
26	105/Chester	EB	D	35.7	E	59.3
		WB	C	24		
		NB	E	60.4		
		SB	F	178.1		

According to the capacity analysis, the intersections of 22nd and Euclid, 30th and Chester, 30th and Euclid, 30th and Carnegie, 30th and Cedar, 55th and Chester, 79th and Chester, 105th and Carnegie, and 105th and Chester are expected to function at an unacceptable Level of Service in 2025.

Table 4 summarizes the 2035 Levels of Service (LOS) and delay per vehicle for the intersections studied. The table shows both the individual approaches to the intersections and the overall intersections.

Table 4. Level of Service / Delay Summary
PM Peak Hour – 2035 (High Estimate Forecast)

Capacity Analysis Summary per Intersection - 2035						
#	Intersection	Approach	Level of Service (LOS)	Delay (Secs/Veh)	LOS Overall Intersection	Delay Overall Intersection
1	24/Chester	EB	A	8.4	B	12.7
		WB	B	11.5		
		NB		-		
		SB	D	41.3		
2	24/Superior	EB	A	6.2	A	9.8
		WB	A	6.3		
		NB	D	35.4		
		SB	D	41.3		
3	22/Prospect	EB	B	12.7	C	26.2
		WB	A	9.3		
		NB	D	41.4		
		SB		-		
4	22/Euclid	EB	D	42	F	261.3
		WB	B	10.4		
		NB	F	690.8		
		SB		-		
5	26/Superior	EB	B	10.5	B	13.5
		WB	A	8		
		NB		-		
		SB	D	44.6		
6	30/Chester	EB	D	36.3	E	64.5
		WB	F	86.7		
		NB	D	50		
		SB	E	57.5		
7	30/Prospect	EB	B	17.6	F	91.4
		WB	B	19		
		NB	E	75.2		
		SB	F	149.5		
8	30/Euclid	EB	B	14.1	E	78.8
		WB	C	23.4		
		NB	C	25.7		
		SB	F	165.8		

<u>Capacity Analysis Summary per Intersection - 2035</u>						
9	30/Carnegie	EB	B	13.1	D	48.2
		WB	B	14.2		
		NB	D	40.8		
		SB	F	105.9		
10	30/Cedar	EB	A	9.3	F	223.8
		WB	B	11.2		
		NB	F	313.9		
		SB	F	280.9		
11	30/Payne	EB	C	30.4	C	29.6
		WB	D	46.1		
		NB	C	20.1		
		SB	B	18.7		
12	30/Superior	EB	A	7.4	B	19.7
		WB	A	7.2		
		NB	D	51.5		
		SB	C	31.7		
13	55/Chester	EB	C	30.8	D	38.6
		WB	C	24.8		
		NB	D	45.2		
		SB	E	71.6		
14	55/Euclid	EB	D	49	C	30.4
		WB	C	25.8		
		NB	C	27.2		
		SB	C	30.6		
15	55/Carnegie	EB	B	16.2	D	41
		WB	C	26.2		
		NB	E	69.9		
		SB	D	50.6		
16	55/Cedar	EB	C	24.1	D	35.7
		WB	C	26.2		
		NB	C	21.5		
		SB	D	46.2		
17	55/Payne	EB	D	38.5	B	11.3
		WB		-		
		NB	A	6.1		
		SB	A	5.5		
18	55/Superior	EB	C	23.3	C	32.7
		WB	D	35		
		NB	D	38.3		
		SB	C	30.9		

<u>Capacity Analysis Summary per Intersection - 2035</u>						
19	79/Cedar	EB	A	7.3	C	22.6
		WB	A	7.4		
		NB	D	46.2		
		SB	D	46.1		
20	79/Carnegie	EB	A	10	C	23.7
		WB	C	20.2		
		NB	D	39.9		
		SB	E	59		
21	79/Euclid	EB	C	25.6	D	40
		WB	C	27.1		
		NB	D	46.5		
		SB	E	55.6		
22	79/Chester	EB	B	16.9	C	31.3
		WB	B	14.7		
		NB	E	62.9		
		SB	F	134.1		
23	105/Cedar	EB	D	45.1	F	159.8
		WB		-		
		NB	B	15.8		
		SB	F	297.6		
24	105/Carnegie	EB	E	67.2	F	202
		WB	C	33.6		
		NB	F	582.7		
		SB	F	222.2		
25	105/Euclid	EB	C	30	F	105.2
		WB	C	31.1		
		NB	F	159.2		
		SB	E	78.9		
26	105/Chester	EB	D	40.7	F	114
		WB	C	25.1		
		NB	F	141.8		
		SB	F	366.2		

According to the capacity analysis, the intersections of 22nd and Euclid, 30th and Chester, 30th and Prospect, 30th and Euclid, 30th and Carnegie, 30th and Cedar, 55th and Chester, 55th and Carnegie, 79th and Carnegie, 79th and Euclid, 79th and Chester, 105th and Cedar, 105th and Carnegie, 105th and Euclid, and 105th and Chester are expected to function at an unacceptable Level of Service in 2035.

The Alternate 3 scenario represents the proposed Innerbelt ramp reconfiguration with the I-90 northbound Carnegie off-ramp in place. This option is expected to impact the intersections of 30th and Carnegie, 30th and Chester, and 30th and Cedar.

Table 5 summarizes the MidTown Alternate 3 Option - 2035 Levels of Service (LOS) and delay per vehicle for the three (3) intersections affected. The table shows both the individual approaches to the intersections and the overall intersections.

Table 5. Level of Service / Delay Summary
PM Peak Hour – 2035 (Alternate 3)

<u>Capacity Analysis Summary - 2035/Alternate 3</u>						
#	Intersection	Approach	Level of Service (LOS)	Delay (Secs/Veh)	LOS Overall Intersection	Delay Overall Intersection
1	30/Carnegie	EB	B	15.3	D	44.4
		WB	B	14.4		
		NB	D	40.8		
		SB	F	105.9		
2	30/Chester	EB	C	28	D	54.5
		WB	E	65.4		
		NB	E	61.7		
		SB	E	57.8		
3	30/Cedar	EB	A	9.2	F	225.8
		WB	B	11		
		NB	F	313.9		
		SB	F	280.9		

According to the capacity analysis, the three (3) intersections studied are expected to function at an unacceptable Level of Service for the Alternate 3 scenario in 2035. The addition of the northbound I-90 off-ramp at Carnegie is not expected to impact the Level of Service or delay in comparison to the proposed Innerbelt ramp reconfiguration during the PM peak hour of 2035.

As part of the capacity analysis, the average queues on each intersection approach were evaluated for the existing conditions, the 2025 scenario, the 2035 scenario, and the Alternate 3 scenario.

Queue Analysis

In order to adequately depict the impact of the queues on the intersection approaches, the distance between intersections was taken into account. Many of the intersections have queues that back past the adjacent intersections. These issues are noted in the following tables.

Table 6 summarizes the average queue summary for the *Existing* conditions. The queues are represented in both feet and number of vehicles for the intersections studied. The table also shows the distance to adjacent intersections.

Table 6. Queue Summary (Feet and Vehicles)
PM Peak Hour – Existing

<u>Critical Queue Summary per Intersection - Existing</u>						
#	Intersection	Approach	Lane	Queue (Feet)	Queue (Vehicles)	Distance to Nearest Intersection (Feet)
1	24/Chester	EB	T	93	3.7	550
		WB	TR	73	2.9	1260
		NB		-	-	-
		SB	L	118	4.7	180
2	24/Superior	EB	R	48	1.9	300
		WB	TR	25	1	280
		NB	T	38	1.5	800
		SB	T	93	3.7	350
3	22/Prospect	EB	L	93	3.7	220
		WB	TR	23	0.9	680
		NB	L	203	8.1	370
		SB		-	-	-
4	22/Euclid	EB	T	23	0.9	200
		WB	T	145	5.8	525
		NB	T	315	12.6	400
		SB		-	-	-
5	26/Superior	EB	R	203	8.1	260
		WB	L	145	5.8	400
		NB		-	-	-
		SB	T	300	12	230
6	30/Chester	EB	TR	193	7.7	1300
		WB	R	250	10	1250
		NB	L	190	7.6	625
		SB	T	328	13.1	300

Critical Queue Summary per Intersection - Existing

7	30/Prospect	EB	R	73	2.9	680
		WB	L	175	7	517
		NB	T	103	4.1	370
		SB	T	278	11.1	370
8	30/Euclid	EB	T	40	1.6	1240
		WB	T	115	4.6	540
		NB	TR	60	2.4	380
		SB	T	270	10.8	621
9	30/Carnegie	EB	T	288	11.5	460
		WB	TR	65	2.6	450
		NB	T	173	6.9	270
		SB	T	313	12.5	370
10	30/Cedar	EB	L	28	1.1	460
		WB	L	35	1.4	620
		NB	T	250	10	700
		SB	T	328	13.1	280
11	30/Payne	EB	L	45	1.8	375
		WB	LR	33	1.3	370
		NB	R	83	3.3	860
		SB	R	128	5.1	800
12	30/Superior	EB	T	58	2.3	180
		WB	R	48	1.9	265
		NB	L	138	5.5	220
		SB	L	98	3.9	390
13	55/Chester	EB	R	203	8.1	1700
		WB	T	140	5.6	600
		NB	T	170	6.8	580
		SB	T	178	7.1	700
14	55/Euclid	EB	T	80	3.2	900
		WB	T	73	2.9	330
		NB	T	225	9	410
		SB	R	240	9.6	560
15	55/Carnegie	EB	T	215	8.6	430
		WB	T	278	11.1	1500
		NB	T	173	6.9	310
		SB	T	215	8.6	430
16	55/Cedar	EB	T	23	0.9	450
		WB	T	25	1	850
		NB	T	143	5.7	330
		SB	T	313	12.5	300

<u>Critical Queue Summary per Intersection - Existing</u>						
17	55/Payne	EB	T	110	4.4	270
		WB		-	-	-
		NB	T	58	2.3	100
		SB	T	50	2	60
18	55/Superior	EB	T	180	7.2	300
		WB	R	130	5.2	330
		NB	T	220	8.8	140
		SB	T	135	5.4	300
19	79/Cedar	EB	TR	20	0.8	250
		WB	TR	23	0.9	470
		NB	T	93	3.7	960
		SB	T	88	3.5	400
20	79/Carnegie	EB	TR	135	5.4	350
		WB	TR	268	10.7	350
		NB	T	150	6	400
		SB	T	218	8.7	760
21	79/Euclid	EB	T	65	2.6	425
		WB	T	145	5.8	650
		NB	T	173	6.9	750
		SB	T	248	9.9	500
22	79/Chester	EB	R	150	6	690
		WB	R	143	5.7	380
		NB	T	250	10	700
		SB	T	290	11.6	190
23	105/Cedar	EB	T	153	6.1	230
		WB		-	-	360
		NB	T	65	2.6	480
		SB	T	120	4.8	350
24	105/Carnegie	EB	TR	385	15.4	350
		WB	T	185	7.4	340
		NB	R	170	6.8	190
		SB	T	118	4.7	400
25	105/Euclid	EB	T	110	4.4	670
		WB	T	88	3.5	510
		NB	T	183	7.3	840
		SB	T	145	5.8	530
26	105/Chester	EB	T	335	13.4	406
		WB	L	115	4.6	540
		NB	R	203	8.1	325
		SB	R	138	5.5	460

According to the queue analysis, queues on the approaches of 26th and Superior, 30th and Chester, 30th and Cedar, 55th and Cedar, 55th and Superior, 79th and Chester, and 105th and Carnegie presently extend past the adjacent intersections.

Table 7 summarizes the average queue summary for the 2025 scenario. The queues are represented in both feet and number of vehicles for the intersections studied. The table also shows the distance to adjacent intersections.

Table 7. Queue Summary (Feet and Vehicles)
PM Peak Hour – 2025

<u>Critical Queue Summary per Intersection - 2025</u>						
#	Intersection	Approach	Lane	Queue (Feet)	Queue (Vehicles)	Distance to Nearest Intersection (Feet)
1	24/Chester	EB	T	103	4.1	550
		WB	R	123	4.9	1260
		NB			-	-
		SB	L	115	4.6	180
2	24/Superior	EB	R	63	2.5	300
		WB	TR	40	1.6	280
		NB	T	35	1.4	800
		SB	T	115	4.6	350
3	22/Prospect	EB	L	115	4.6	220
		WB	TR	30	1.2	680
		NB	L	243	9.7	370
		SB			-	-
4	22/Euclid	EB	L	135	5.4	200
		WB	T	178	7.1	525
		NB	T	483	19.3	400
		SB			-	-
5	26/Superior	EB	R	180	7.2	260
		WB	L	103	4.1	400
		NB			-	-
		SB	T	220	8.8	230
6	30/Chester	EB	TR	288	11.5	1300
		WB	R	640	25.6	1250
		NB	L	145	5.8	625
		SB	T	363	14.5	300
7	30/Prospect	EB	R	63	2.5	680
		WB	L	138	5.5	517
		NB	L	133	5.3	370
		SB	T	558	22.3	370

<u>Critical Queue Summary per Intersection - 2025</u>						
8	30/Euclid	EB	T	63	2.5	1240
		WB	T	208	8.3	540
		NB	TR	45	1.8	380
		SB	T	540	21.6	621
9	30/Carnegie	EB	T	163	6.5	460
		WB	T	93	3.7	450
		NB	T	228	9.1	270
		SB	T	463	18.5	370
10	30/Cedar	EB	L	28	1.1	460
		WB	LR	43	1.7	620
		NB	T	673	26.9	700
		SB	T	530	21.2	280
11	30/Payne	EB	L	78	3.1	375
		WB	R	90	3.6	370
		NB	R	123	4.9	860
		SB	R	130	5.2	800
12	30/Superior	EB	T	53	2.1	180
		WB	TR	43	1.7	265
		NB	L	153	6.1	220
		SB	L	98	3.9	390
13	55/Chester	EB	R	258	10.3	1700
		WB	T	165	6.6	600
		NB	T	190	7.6	580
		SB	T	190	7.6	700
14	55/Euclid	EB	T	158	6.3	900
		WB	T	135	5.4	330
		NB	T	255	10.2	410
		SB	R	278	11.1	560
15	55/Carnegie	EB	T	183	7.3	430
		WB	T	308	12.3	1500
		NB	T	260	10.4	310
		SB	T	278	11.1	430
16	55/Cedar	EB	T	35	1.4	450
		WB	L	43	1.7	850
		NB	T	165	6.6	330
		SB	T	408	16.3	300
17	55/Payne	EB	T	115	4.6	270
		WB			-	-
		NB	T	70	2.8	100
		SB	T	58	2.3	60

<u>Critical Queue Summary per Intersection - 2025</u>						
18	55/Superior	EB	T	173	6.9	300
		WB	R	128	5.1	330
		NB	T	220	8.8	140
		SB	T	135	5.4	300
19	79/Cedar	EB	TR	10	0.4	250
		WB	TR	10	0.4	470
		NB	T	98	3.9	960
		SB	T	98	3.9	400
20	79/Carnegie	EB	TR	123	4.9	350
		WB	R	343	13.7	350
		NB	T	165	6.6	400
		SB	T	250	10	760
21	79/Euclid	EB	T	78	3.1	425
		WB	T	178	7.1	650
		NB	T	203	8.1	750
		SB	T	293	11.7	500
22	79/Chester	EB	R	178	7.1	690
		WB	R	153	6.1	380
		NB	T	268	10.7	700
		SB	T	338	13.5	190
23	105/Cedar	EB	T	125	5	230
		WB			-	360
		NB	T	165	6.6	480
		SB	T	280	11.2	350
24	105/Carnegie	EB	R	598	23.9	350
		WB	T	253	10.1	340
		NB	R	958	38.3	190
		SB	L	343	13.7	400
25	105/Euclid	EB	T	135	5.4	670
		WB	T	160	6.4	510
		NB	T	383	15.3	840
		SB	T	268	10.7	530
26	105/Chester	EB	T	440	17.6	406
		WB	T	138	5.5	540
		NB	R	453	18.1	325
		SB	R	675	27	460

According to the queue analysis, queues on the approaches of 22nd and Euclid, 30th and Chester, 30th and Prospect, 30th and Carnegie, 30th and Cedar, 55th and Cedar, 55th and

Superior, 79th and Chester, 105th and Carnegie, and 105th and Chester are expected to extend past the adjacent intersections.

It should be noted that along the East 30th Street corridor between Euclid and Cedar, queues in the southbound direction are expected to back past the adjacent intersections to the north in 2025. This means that the back-up of vehicles in this area is expected to extend approximately 1,200 feet.

Table 8 summarizes the average queue summary for the 2035 scenario. The queues are represented in both feet and number of vehicles for the intersections studied. The table also shows the distance to adjacent intersections.

Table 8. Queue Summary (Feet and Vehicles)
PM Peak Hour – 2035

<u>Critical Queue Summary per Intersection – 2035</u>						
#	Intersection	Approach	Lane	Queue (Feet)	Queue (Vehicles)	Distance to Nearest Intersection (Feet)
1	24/Chester	EB	T	115	4.6	550
		WB	R	188	7.5	1260
		NB			-	-
		SB	L	110	4.4	180
2	24/Superior	EB	R	78	3.1	300
		WB	TR	58	2.3	280
		NB	L	35	1.4	800
		SB	T	135	5.4	350
3	22/Prospect	EB	L	145	5.8	220
		WB	TR	40	1.6	680
		NB	L	308	12.3	370
		SB			-	-
4	22/Euclid	EB	L	163	6.5	200
		WB	T	213	8.5	525
		NB	T	655	26.2	400
		SB			-	-
5	26/Superior	EB	R	133	5.3	260
		WB	L	68	2.7	400
		NB			-	-
		SB	T	110	4.4	230

<u>Critical Queue Summary per Intersection – 2035</u>						
6	30/Chester	EB	R	383	15.3	1300
		WB	R	845	33.8	1250
		NB	T	30	1.2	625
		SB	T	395	15.8	300
7	30/Prospect	EB	L	53	2.1	680
		WB	L	90	3.6	517
		NB	L	133	5.3	370
		SB	T	1103	44.1	370
8	30/Euclid	EB	T	83	3.3	1240
		WB	T	303	12.1	540
		NB	TR	35	1.4	380
		SB	T	1028	41.1	621
9	30/Carnegie	EB	TR	73	2.9	460
		WB	T	115	4.6	450
		NB	T	303	12.1	270
		SB	T	693	27.7	370
10	30/Cedar	EB	L	30	1.2	460
		WB	R	53	2.1	620
		NB	T	1353	54.1	700
		SB	T	1228	49.1	280
11	30/Payne	EB	R	240	9.6	375
		WB	R	345	13.8	370
		NB	R	163	6.5	860
		SB	R	138	5.5	800
12	30/Superior	EB	T	48	1.9	180
		WB	R	40	1.6	265
		NB	L	168	6.7	220
		SB	L	98	3.9	390
13	55/Chester	EB	R	320	12.8	1700
		WB	T	193	7.7	600
		NB	T	213	8.5	580
		SB	L	218	8.7	700
14	55/Euclid	EB	T	265	10.6	900
		WB	T	225	9	330
		NB	T	285	11.4	410
		SB	R	315	12.6	560
15	55/Carnegie	EB	T	145	5.8	430
		WB	T	335	13.4	1500
		NB	T	410	16.4	310
		SB	T	373	14.9	430

<u>Critical Queue Summary per Intersection – 2035</u>						
16	55/Cedar	EB	T	50	2	450
		WB	L	60	2.4	850
		NB	T	185	7.4	330
		SB	R	538	21.5	300
17	55/Payne	EB	T	120	4.8	270
		WB	T		-	-
		NB	T	80	3.2	100
		SB	T	65	2.6	60
18	55/Superior	EB	T	170	6.8	300
		WB	R	123	4.9	330
		NB	T	220	8.8	140
		SB	T	135	5.4	300
19	79/Cedar	EB	T	23	0.9	250
		WB	T	28	1.1	470
		NB	T	110	4.4	960
		SB	T	115	4.6	400
20	79/Carnegie	EB	TR	103	4.1	350
		WB	R	415	16.6	350
		NB	T	188	7.5	400
		SB	T	303	12.1	760
21	79/Euclid	EB	T	90	3.6	425
		WB	T	213	8.5	650
		NB	T	230	9.2	750
		SB	T	340	13.6	500
22	79/Chester	EB	R	205	8.2	690
		WB	R	165	6.6	380
		NB	T	278	11.1	700
		SB	T	378	15.1	190
23	105/Cedar	EB	T	95	3.8	230
		WB			-	360
		NB	T	383	15.3	480
		SB	T	2043	81.7	350
24	105/Carnegie	EB	R	820	32.8	350
		WB	T	310	12.4	340
		NB	R	2318	92.7	190
		SB	L	548	21.9	400
25	105/Euclid	EB	T	118	4.7	670
		WB	T	215	8.6	510
		NB	R	965	38.6	840
		SB	T	598	23.9	530

<u>Critical Queue Summary per Intersection – 2035</u>						
26	105/Chester	EB	T	493	19.7	406
		WB	T	160	6.4	540
		NB	R	838	33.5	325
		SB	R	1255	50.2	460

According to the queue analysis, queues on the approaches of 22nd and Euclid, 30th and Chester, 30th and Prospect, 30th and Euclid, 30th and Carnegie, 30th and Cedar, 55th and Carnegie, 55th and Cedar, 55th and Superior, 79th and Carnegie, 79th and Chester, 105th and Cedar, 105th and Carnegie, 105th and Euclid, and 105th and Chester are expected to extend past the adjacent intersections.

It should be noted that along the East 30th Street corridor between Chester and Cedar, queues in the southbound direction are expected to back past the adjacent intersections to the north in 2035. The queues in the northbound direction between Cedar and Carnegie are expected to back past the adjacent intersections to the south. This is expected to result in gridlock along E. 30th.

Similarly the E. 105th Street corridor is expected to experience major queues in the northbound and southbound directions during the PM peak hour of traffic in 2035. This will also most likely result in gridlock.

Table 9 summarizes the MidTown Alternate 3 Option - 2035 average queue summary for the three (3) intersections affected by the addition of the I-90 northbound Carnegie off-ramp. The queues are represented in both feet and number of vehicles for the intersections studied. The table also shows the distance to adjacent intersections.

Table 9. Queue Summary (Feet and Vehicles)
PM Peak Hour – 2035 – Alternate 3

<u>Critical Queue per Intersection - 2035 ALTERNATE 3</u>						
#	Intersection	Approach	Lane	Queue (Feet)	Queue (Vehicles)	Distance to Nearest Intersection (Feet)
1	30/Carnegie	EB	TL	145	5.8	460
		WB	T	115	4.6	450
		NB	T	303	12.1	270
		SB	T	693	27.7	370
2	30/Chester	EB	T	213	8.5	1300
		WB	R	798	31.9	1250
		NB	L	120	4.8	625
		SB	T	395	15.8	300
3	30/Cedar	EB	L	28	1.1	460
		WB	LR	50	2	620
		NB	T	1353	54.1	700
		SB	T	1228	49.1	280

According to the queue analysis, queues on the approaches of 30th and Chester, 30th and Carnegie, and 30th and Cedar are expected to extend past the adjacent intersections during the 2035 PM peak hour of traffic. The addition of the I-90 northbound Carnegie off-ramp is not expected to affect the queues when compared with the 2035 proposed Innerbelt ramp configuration scenario.

Appendix B

Exhibit B-1A Downtown Estimates of Total Daily Activities: Existing and Option 1																
	Existing							Projections to 2035								
	Benchmark	Daily						Benchmark	Daily							
		Weekday		Weeknight		Weekend			Weekday		Weeknight		Weekend			
Downtown Employment	120,000		108,000	a	6,000		6,000		142,800	a	128,500	a	7,100		7,100	
Entertainment																
Playhouse Square	1,150,000	b			3,700	b	3,700	b	1,400,000	b			4,500	b	4,500	b
Gateway - Indians,Cavs, Other	2,666,000	c			22,000	c	22,000	c	3,330,000	c			27,300	c	27,300	c
Rock ‘n Roll Hall of Fame	465,000	d	1,300	d			1,300	d	581,000	d	1,600	d			1,600	d
Greater CLE Aquarium	400,000	e	1,100	e			1,100	e	500,000	e	1,400	e			1,400	e
“Late Night” (HWD, E 4th)					8,000	f	8,000	f					10,000	f	10,000	f
First Energy Stadium	527,000	g					65,900	g	560,000						70,000	g
Wolstein Center	375,000		300		1,500		2,300		470,000		350		1,850		2,800	
CSU Visitors (Exc of Wolstein Center)	116,700		100		100		500		140,000		200		200		500	
Hotels			2,300		2,300	h	2,300	h			3,500		3,500	h	3,500	h
Residential		i	11,700	i	11,700	i	11,700	i			20,000	i	20,000	i	20,000	i
Students	18,000		11,400		5,600		1,000		20,700		13,200		6,600		2,100	
Convention Center/Medical Mart	-		-		-		-		300,000	o	800	o			800	o
Casino	-		-		-		-		5,000,000	p	8,400	p	8,400	p	8,400	p
Total Estimate of Daily Activities			136,200		60,900		125,800				177,950		89,450		160,000	

Exhibit B – 1B- Downtown Estimates of Total Daily Activities: Existing and Option 2

	Existing						Projections to 2035					
	Benchmark	Daily					Benchmark	Daily				
		Weekday	Weeknight	Weekend				Weekday	Weeknight	Weekend		
Downtown Employment	120,000	108,000	a	6,000		6,000	136,200	a	122,600	a	6,800	6,800
Entertainment												
Playhouse Square	1,150,000	b		3,700	b	3,700	1,400,000	b		4,500	b	4,500
Gateway - Indians,Cavs, Other	2,666,000	c		22,000	c	22,000	3,330,000	c		27,300	c	27,300
Rock 'n Roll Hall of Fame	465,000	d	1,300	d		1,300	581,000	d	1,600	d		1,600
Greater CLE Aquarium	400,000	e	1,100	e		1,100	500,000	e	1,400	e		1,400
"Late Night" (HWD, E 4th)				8,000	f	8,000				10,000	f	10,000
First Energy Stadium	527,000	g				65,900	560,000					70,000
Wolstein Center	375,000		300	1,500		2,300	470,000		350	1,850		2,800
CSU Visitors (Exc of Wolstein Center)	116,700		100	100		500	140,000		200	200		500
Hotels			2,300	2,300	h	2,300			2,900	2,900	h	2,900
Residential		i	11,700	i	11,700	i			16,000	i	16,000	i
Students	18,000		11,400	5,600		1,000	20,700		13,200	6,600		2,100
Convention Center/Medical Mart	-		-	-		-	300,000	o	800	o		800
Casino	-		-	-		-	5,000,000	p	8,400	p	8,400	p
Total Estimate of Daily Activities			136,200	60,900		125,800			167,450	84,550		155,100

Exhibit B-2A- Downtown Estimate of Vehicles in Use Per Day: Existing and Option 1

		Existing				Projections to 2035			
		Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
Downtown Employment	(5% PT)	114,000	102,600	5,700	5,700	135,700	122,000	6,800	6,800
Entertainment									
Playhouse Square	(2/VEH)	575,000		1,800	1,800	700,000		2,200	2,200
Gateway - Indians,Cavs, Other	(5% PT, 2/VEH)	1,266,000		10,500	10,500	1,582,000		13,000	13,000
Rock 'n Roll Hall of Fame	(2/VEH)	233,000	650		650	290,500	800		800
Greater CLE Aquarium	(2/VEH)	200,000	550		550	250,000	700		700
"Late Night" (HWD, E 4th)	(2/VEH)			4,000	4,000			5,000	5,000
First Energy Stadium	(5% PT, 2/VEH)	250,000			31,300	266,000			33,300
Wolstein Center	(2/VEH)	187,500	150	750	1,150	235,000	175	925	1,400
CSU Visitors - Exc of Wolstein Center	(1.5/VEH)	77,800	70	70	400	93,300	130	130	500
Hotels			0	0	0		0	0	0
Residential	(1/DU, 1.5 PPL/DU)		7,800	7,800	7,800		13,500	13,500	13,500
Students	(10% PT, 1/VEH)	16,200	10,300	5,000	900	18,600	11,900	5,900	1,900
Convention Center/Medical Mart	(1.5/VEH)	-	-	-	-	200,000	500		500
Casino	(2/VEH)	-	-	-	-	2,500,000	4,200	4,200	4,200
Total Vehicles in Use Per Day			122,120	35,620	64,750		153,905	51,655	83,800

PT = Public Transit

VEH = Vehicle

DU = Dwelling Units

PPL = Persons

Exhibit B-2B- Downtown Estimate of Vehicles in Use Per Day: Existing and Option 2

		Existing				Projections to 2035			
		Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
Downtown Employment	(5% PT)	114,000	102,600	5,700	5,700	122,600	110,300	6,100	6,100
Entertainment									
Playhouse Square	(2/VEH)	575,000		1,800	1,800	700,000		2,250	2,250
Gateway - Indians,Cavs, Other	(5% PT, 2/VEH)	1,266,000		10,500	10,500	1,582,000		13,000	13,000
Rock 'n Roll Hall of Fame	(2/VEH)	233,000	650		650	290,500	800		800
Greater CLE Aquarium	(2/VEH)	200,000	550		550	250,000	700		700
"Late Night" (HWD, E 4th)	(2/VEH)			4,000	4,000			5,000	5,000
First Energy Stadium	(5% PT, 2/VEH)	250,000			31,300	266,000			33,300
Wolstein Center	(2/VEH)	187,500	150	750	1,150	235,000	175	925	1,400
CSU Visitors - Exc of Wolstein Center	(1.5/VEH)	77,800	70	70	400	93,300	130	130	500
Hotels			0	0	0		0	0	0
Residential	(1/DU, 1.5 PPL/DU)		7,800	7,800	7,800		10,700	10,700	10,700
Students	(10% PT, 1/VEH)	16,200	10,300	5,000	900	18,600	11,900	5,900	1,900
Convention Center/Medical Mart	(1.5/VEH)					200,000	500		500
Casino	(2/VEH)					2,500,000	4,200	4,200	4,200
Total Vehicles in Use Per Day			122,120	35,620	64,750		139,405	48,205	80,350

PT = Public Transit

VEH = Vehicle

DU = Dwelling Units

PPL = Persons

Exhibit B-3A - Downtown Estimate of Vehicle Trips Per Day: Existing and Option 1

		Existing				Projections to 2035			
		Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
Downtown Employment	(3/PPL)	342,000	307,800	17,100	17,100	407,100	366,000	20,400	20,400
Entertainment									
Playhouse Square	(2/VEH)	1,150,000		3,600	3,600	1,400,000		4,400	4,400
Gateway - Indians,Cavs, Other	(2/VEH)	2,532,000		21,000	21,000	3,164,000		26,000	26,000
Rock 'n Roll Hall of Fame	(2/VEH)	466,000	1,300		1,300	581,000	1,600		1,600
Greater CLE Aquarium	(2/VEH)	200,000	550		550	250,000	700		700
"Late Night"(HWD, E 4th)	(2/VEH)			8,000	8,000			10,000	10,000
First Energy Stadium	(5% PT, 2/VEH)	500,000			62,600	532,000			66,600
Wolstein Center	(2/VEH)	375,000	300	1,500	2,300	470,000	350	1,850	2,800
CSU Visitors - Exc of Wolstein Center	(2/VEH)	155,600	140	140	800	186,600	260	260	1,000
Hotels			0	0	0		0	0	0
Residential	1.5 /DU (WD), 1.5/DU (WN), 4/DU (WE)		11,700	11,700	31,200		20,000	20,000	53,000
Students	(2/VEH)	16,200	20,600	10,000	1,800	37,200	23,800	11,800	3,800
Convention Center/Medical Mart	(2/VEH)	-	-	-	-	400,000	1,000		1,000
Casino	(2/VEH)	-	-	-	-	5,000,000	8,400	8,400	8,400
Total Vehicle Trips Per Day			342,390	73,040	150,250		422,110	103,110	199,700

PPL = Persons

VEH = Vehicle

PT = Public Transit

DU = Dwelling Unit

WD = Weekday

WN = Weeknight

WE = Weekend

Exhibit B-3B - Downtown Estimate of Vehicle Trips Per Day: Existing and Option 2

		Existing				Projections to 2035			
		Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
Downtown Employment	(3/PPL)	342,000	307,800	17,100	17,100	367,800	330,900	18,300	18,300
Entertainment									
Playhouse Square	(2/VEH)	1,150,000		3,600	3,600	1,400,000		4,400	4,400
Gateway - Indians,Cavs, Other	(2/VEH)	2,532,000		21,000	21,000	3,164,000		26,000	26,000
Rock 'n Roll Hall of Fame	(2/VEH)	466,000	1,300		1,300	581,000	1,600		1,600
Greater CLE Aquarium	(2/VEH)	200,000	550		550	250,000	700		700
"Late Night" (HWD, E 4th)	(2/VEH)			8,000	8,000			10,000	10,000
First Energy Stadium	(5% PT, 2/VEH)	500,000			62,600	532,000			66,600
Wolstein Center	(2/VEH)	375,000	300	1,500	2,300	470,000	350	1,850	2,800
CSU Visitors - Exc of Wolstein Center	(2/VEH)	155,600	140	140	800	186,600	260	260	1,000
Hotels			0	0	0		0	0	0
Residential	1.5 /DU (WD), 1.5/DU (WN), 4/DU (WE)		11,700	11,700	31,200		16,000	16,000	42,500
Students	(2/VEH)	16,200	20,600	10,000	1,800	37,200	23,800	11,800	3,800
Convention Center/Medical Mart	(2/VEH)					400,000	1,000		1,000
Casino	(2/VEH)					5,000,000	8,400	8,400	8,400
Total Vehicle Trips Per Day			342,390	73,040	150,250		383,010	97,010	187,100

PPL = Persons

VEH = Vehicle

PT = Public Transit

DU = Dwelling Unit

WD = Weekday

WN = Weeknight

WE = Weekend

Exhibit B-4A - Health Tech Corridor Estimates of Total Daily Activities: Existing & Option 1

	Existing								Projections to 2035							
	Benchmark		Daily						Benchmark		Daily					
			Weekday		Weeknight		Weekend				Weekday		Weeknight		Weekend	
University Circle																
Employment*	35,000	a ¹	26,300	b ¹	3,500	b ¹	5,300	b ¹	53,000	a ²	39,800	b ¹	5,300	b ¹	8,000	b ¹
Visitors/Patients**	2,200,000	a	6,300	b ²	800	b ²	3,000	b ²	2,730,000	c	7,900	b ²	1,000	b ²	8,000	b ²
Students	10,000	d	9,300	e	4,700	e	4,700	e	10,000	f	9,300	e	4,700	e	4,700	e
Residents	5,200	a	5,200	a	5,200	a	5,200	a	11,200	a ³	11,200	a ³	11,200	a ³	11,200	a ³
Cleveland Clinic																
Employment	26,200	g	11,400	g ¹	5,100	g ¹	9,700	g ¹	30,700	h ¹	13,300	g ²	6,000	g ²	11,400	g ²
Patients/Visitors	3,000,000	g	9,000	i	2,100	i	2,100	i	3,750,000	h ²	11,300	i	2,500	i	2,500	i
Residents	400		400		400		400		400		400		400		400	
Campus District																
Employment	5,000	k	3,500	k	1,000	k	500	k	6,000	k	4,200	k	1,200	k	600	k
Students	10,600	n	7,400	n	2,100	n	1,000	n	11,700	n	8,200	n	2,300	n	1,200	n
Residents	3,200	o	3,200		3,200		3,200		5,000	o	5,000		5,000		5,000	
MidTown																
Employment	10,000	p	7,000	p	2,000	p	1,000	p	14,500	p	10,200	p	2,900	p	1,500	p
Visitors		q		q		q		q		q		q		q		q
Residents	2,000	r	2,000		2,000		2,000		3,000	r	3,000		3,000		3,000	
AsiaTown																
Employment	1,500		1,050		300		150		1,500		1,050		300		150	
Retail	995		310		155		310		995		310		155		310	
Residents	1,560		1,560		1,560		1,560		1,560		1,560		1,560		1,560	
Total Estimate of Daily Activities			93,920		34,115		40,120				126,720		47,515		59,520	

Exhibit B-4B - Health Tech Corridor Estimates of Total Daily Activities: Existing & Option 2

	Existing								Projections to 2035							
	Benchmark		Daily						Benchmark		Daily					
			Weekday		Weeknight		Weekend				Weekday		Weeknight		Weekend	
University Circle																
Employment*	35,000	a ¹	26,300	b ¹	3,500	b ¹	5,300	b ¹	44,000	a ²	33,000	b ¹	4,400	b ¹	6,600	b ¹
Visitors/Patients**	2,200,000	a	6,300	b ²	800	b ²	3,000	b ²	2,465,000	c	7,100	b ²	950	b ²	3,500	b ²
Students	10,000	d	9,300	e	4,700	e	4,700	e	10,000	f	9,300	e	4,700	e	4,700	e
Residents	5,200	a	5,200	a	5,200	a	5,200	a	8,200	a ³	8,200	a ³	8,200	a ³	8,200	a ³
Cleveland Clinic																
Employment	26,200	g	11,400	g ¹	5,100	g ¹	9,700	g ¹	28,300	h ¹	12,300	g ²	5,500	g ²	10,500	g ²
Patients/Visitors	3,000,000	g	9,000	i	2,100	i	2,100	i	3,375,000	h ²	10,300	h ²	2,400	h ²	2,400	h ²
Residents	400		400		400		400		400		400		400		400	
Campus District																
Employment	5,000	k	3,500	k	1,000	k	500	k	5,500	k	3,700	k	1,100	k	600	k
Students	10,600	n	7,400	n	2,100	n	1,000	n	11,700	n	8,200	n	2,300	n	1,200	n
Residents	3,200	o	3,200		3,200		3,200		4,100	o	4,100		4,100		4,100	
MidTown																
Employment	10,000	p	7,000	p	2,000	p	1,000	p	12,300	p	8,700	p	2,500	p	1,300	p
Visitors		q		q		q		q		q		q		q		q
Residents	2,000	r	2,000		2,000		2,000		2,500	r	2,500		2,500		2,500	
AsiaTown																
Employment	1,500		1,050		300		150		1,500		1,050		300		150	
Retail	995		310		155		310		995		310		155		310	
Residents	1,560		1,560		1,560		1,560		1,560		1,560		1,560		1,560	
Total Estimate of Daily Activities			93,920		34,115		40,120				110,720		41,065		48,020	

Exhibit B-5A - Health Tech Corridor Estimates of Vehicles in Use Per Day: Existing & Option 1

		Existing						Projections to 2035					
		Benchmark	Daily			Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
University Circle													
Employment*	(1/VEH)	35,000	26,300	3,500	5,300	53,000	39,800	5,300	8,000				
Visitors/Patients**	(1.50/VEH)	1,466,700	4,200	500	2,000	1,820,000	5,300	700	5,300				
Students	(.5/VEH)	5,000	4,700	2,300	2,300	5,000	4,700	2,300	2,300				
Residents	(1.5 PPL/DU, 1 VEH/DU)	3,500	3,500	3,500	3,500	7,500	7,500	7,500	7,500				
Cleveland Clinic													
Employment	(1/VEH)	26,200	11,400	5,100	9,700	30,700	13,300	6,000	11,400				
Patients/Visitors	(1.25/VEH)	2,400,000	7,200	1,650	1,650	3,000,000	9,040	2,000	2,000				
Residents	(2 PPL/DU, 1.5 VEH/DU)	300	300	300	300	300	300	300	300				
Campus District													
Employment	(1 PPL/VEH)	5,000	3,500	1,000	500	6,000	4,200	1,200	600				
Students	(1 PPL/VEH)	10,600	7,400	2,100	1,000	11,700	8,200	2,300	1,200				
Residents	(2 PPL/DU, 1.5 VEH/DU)	2,400	2,400	2,400	2,400	3,800	3,800	3,800	3,800				
MidTown													
Employment	(1/VEH)	10,000	7,000	2,000	1,000	14,500	10,200	2,900	1,500				
Visitors													
Residents	(2 PPL/DU, 1.5 VEH/DU)	1,500	1,500	1,500	1,500	2,300	2,300	2,300	2,300				
AsiaTown													
Employment	(1/VEH)	1,500	1,050	300	150	1,500	1,050	300	150				
Retail	(1.50/VEH)												
Residents	(2.5 PPL/DU, 1.5 VEH/DU)	935	935	935	935	935	935	935	935				
Total Vehicles in Use			81,385	27,085	32,235		110,625	37,835	47,285				

VEH = Vehicle

PPL = Persons

DU = Dwelling Unit

Exhibit B-5B - Health Tech Corridor Estimates of Vehicles in Use Per Day: Existing & Option 2

		Existing						Projections to 2035					
		Benchmark	Daily			Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
University Circle													
Employment*	(1/VEH)	35,000	26,300	3,500	5,300	44,000	33,000	4,400	6,600				
Visitors/Patients**	(1.50/VEH)	1,466,700	4,200	500	2,000	1,643,300	4,800	650	2,350				
Students	(.5/VEH)	5,000	4,700	2,300	2,300	5,000	4,700	2,300	2,300				
Residents	(1.5 PPL/DU, 1 VEH/DU)	3,500	3,500	3,500	3,500	5,500	5,500	5,500	5,500				
Cleveland Clinic													
Employment	(1/VEH)	26,200	11,400	5,100	9,700	28,300	12,300	5,500	10,500				
Patients/Visitors	(1.25/VEH)	2,400,000	7,200	1,650	1,650	2,700,000	8,250	1,900	1,900				
Residents	(2 PPL/DU, 1.5 VEH/DU)	300	300	300	300	300	300	300	300				
Campus District													
Employment	(1 PPL/VEH)	5,000	3,500	1,000	500	5,500	3,700	1,100	600				
Students	(1 PPL/VEH)	10,600	7,400	2,100	1,000	11,700	8,200	2,300	1,200				
Residents	(2 PPL/DU, 1.5 VEH/DU)	2,400	2,400	2,400	2,400	3,100	3,100	3,100	3,100				
MidTown													
Employment	(1/VEH)	10,000	7,000	2,000	1,000	12,300	8,700	2,500	1,300				
Visitors													
Residents	(2 PPL/DU, 1.5 VEH/DU)	1,500	1,500	1,500	1,500	1,900	1,900	1,900	1,900				
AsiaTown													
Employment	(1/VEH)	1,500	1,050	300	150	1,500	1,050	300	150				
Retail	(1.50/VEH)												
Residents	(2.5 PPL/DU, 1.5 VEH/DU)	935	935	935	935	935	935	935	935				
Total Vehicles in Use			81,385	27,085	32,235		96,435	32,685	38,635				

VEH = Vehicle

PPL = Persons

DU = Dwelling Unit

Exhibit B-6A - Health Tech Corridor Estimates of Vehicle Trips Per Day: Existing & Option 1

		Existing						Projections to 2035					
		Benchmark	Daily			Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
University Circle													
Employment*	(3/D)	105,000	78,900	10,500	15,900	156,000	119,400	15,900	24,000				
Visitors/Patients**	(2/D)	2,933,400	8,400	1,000	4,000	3,640,000	10,400	1,400	10,400				
Students	(2/D, 2/N, 4/E)	5,000	9,400	4,600	9,200	5,000	9,400	4,600	9,200				
Residents	(2/D, 2/N, 4/E)	3,500	7,000	7,000	14,000	7,500	15,000	15,000	30,000				
Cleveland Clinic													
Employment	(3/D)	78,600	34,200	15,300	29,100	92,100	39,900	18,000	34,200				
Patients/Visitors	(2/D)	4,800,000	14,400	3,300	3,300	6,000,000	19,000	4,000	4,000				
Residents	(2/D, 2/N, 4/E)	300	600	600	1,200	300	600	600	1,200				
Campus District													
Employment	(3/D)	15,000	10,500	3,000	1,500	18,000	12,600	3,600	1,800				
Students	(2/D)	21,200	14,800	4,200	2,000	23,400	16,400	4,600	2,400				
Residents	(2/D, 2/N, 4/E)	2,400	4,800	4,800	9,600	3,800	7,600	7,600	15,200				
MidTown													
Employment	(3/D)	30,000	21,000	6,000	3,000	43,500	30,600	9,700	4,500				
Visitors													
Residents	(2/D, 2/N, 4/E)	1,500	3,000	3,000	6,000	2,300	4,600	4,600	9,200				
AsiaTown													
Employment	(3/D)	4,500	3,150	900	450	4,500	3,150	900	450				
Retail													
Residents	(4/D, 4/N, 8/E)	1,560	2,500	2,500	5,000	1,560	2,500	2,500	5,000				
Total Vehicle Trips Per Day			212,650	66,700	104,250		291,150	93,000	151,550				

D = Weekday

N = Weeknight

E = Weekend

Exhibit B-6B - Health Tech Corridor Estimates of Vehicle Trips Per Day: Existing & Option 2

		Existing						Projections to 2035					
		Benchmark	Daily			Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
University Circle													
Employment*	(3/D)	105,000	78,900	10,500	15,900	132,000	99,000	13,200	19,800				
Visitors/Patients**	(2/D)	2,933,400	8,400	1,000	4,000	3,286,600	9,600	1,300	4,700				
Students	(2/D, 2/N, 4/E)	5,000	9,400	4,600	9,200	5,000	9,400	4,600	9,600				
Residents	(2/D, 2/N, 4/E)	3,500	7,000	7,000	14,000	5,500	11,000	11,000	22,000				
Cleveland Clinic													
Employment	(3/D)	78,600	34,200	15,300	29,100	84,900	36,900	16,500	31,500				
Patients/Visitors	(2/D)	4,800,000	14,400	3,300	3,300	5,400,000	16,500	3,800	3,800				
Residents	(2/D, 2/N, 4/E)	300	600	600	1,200	300	600	600	1,200				
Campus District													
Employment	(3/D)	15,000	10,500	3,000	1,500	16,500	11,100	3,300	1,800				
Students	(2/D)	21,200	14,800	4,200	2,000	23,400	16,400	4,600	2,400				
Residents	(2/D, 2/N, 4/E)	2,400	4,800	4,800	9,600	3,100	6,200	6,200	12,400				
MidTown													
Employment	(3/D)	30,000	21,000	6,000	3,000	36,900	26,100	7,500	3,900				
Visitors													
Residents	(2/D, 2/N, 4/E)	1,500	3,000	3,000	6,000	1,900	3,800	3,800	7,600				
AsiaTown													
Employment	(3/D)	4,500	3,150	900	450	4,500	3,150	900	450				
Retail													
Residents	(4/D, 4/N, 8/E)	1,560	2,500	2,500	5,000	1,560	2,500	2,500	5,000				
Total Activity Estimate			212,650	66,700	104,250		252,250	79,800	126,150				

D = Weekday

N = Weeknight

E = Weekend

Exhibit B-7A - Differences between Downtown Estimates of Total Daily Activities: Existing and Option 1 and Option 2

	Option 1					Option 2				
	<i>Benchmark</i>	Daily				<i>Benchmark</i>	Daily			
		Weekday	Weeknight	Weekend			Weekday	Weeknight	Weekend	
Downtown Employment	22,800	20,500	1,100	1,100		16,200	14,600	800	800	
Entertainment										
Playhouse Square	250,000		800	800		250,000		800	800	
Gateway - Indians,Cavs, Other	664,000		5,300	5,300		664,000		5,300	5,300	
Rock 'n Roll Hall of Fame	116,000	300		300		116,000	300		300	
Greater CLE Aquarium	100,000	300		300		100,000	300		300	
"Late Night" (HWD, E 4th)			2,000	2,000				2,000	2,000	
Cleveland Browns Stadium	33,000			4,100		33,000			4,100	
Wolstein Center	95,000	50	350	500		95,000	50	350	500	
CSU Visitors (Exc of Wolstein Center)	23,300	100	100			23,300	100	100		
Hotels		1,200	1,200	1,200			600	600	600	
Residential		8,300	8,300	8,300			4,300	4,300	4,300	
Students	2,700	1,800	1,000	1,100		2,700	1,800	1,000	1,100	
Convention Center/Medical Mart	300,000	800		800		300,000	800		800	
Casino	5,000,000	8,400	8,400	8,400		5,000,000	8,400	8,400	8,400	
Total Estimate of Daily Activities		41,750	28,550	34,200			31,250	23,650	29,300	

Exhibit B-7B- Differences between Downtown Estimate of Vehicles in Use Per Day: Existing and Option 1 & Option 2

		Option 1				Option 2			
		Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
Downtown Employment	(5% PT)	21,700	19,400	1,100	1,100	8,600	7,700	400	400
Entertainment									
Playhouse Square	(2/VEH)	125,000		400	400	125,000		450	450
Gateway - Indians,Cavs, Other	(5% PT, 2/VEH)	316,000		2,500	2,500	316,000		2,500	2,500
Rock 'n Roll Hall of Fame	(2/VEH)	57,500	150		150	57,500	150		150
Greater CLE Aquarium	(2/VEH)	50,000	150		150	50,000	150		150
"Late Night" (HWD, E 4th)	(2/VEH)			1,000	1,000			1,000	1,000
First Energy Stadium	(5% PT, 2/VEH)	16,000			2,000	16,000			2,000
Wolstein Center	(2/VEH)	47,500	25	175	250	47,500	25	175	250
CSU Visitors - Exc of Wolstein Center	(1.5/VEH)	15,500	60	60	100	15,500	60	60	100
Hotels									
Residential	(1/DU, 1.5 PPL/DU)		5,700	5,700	5,700		2,900	2,900	2,900
Students	(10% PT, 1/VEH)	2,400	1,600	900	1,000	2,400	1,600	900	1,000
Convention Center/Medical Mart	(1.5/VEH)	200,000	500		500	200,000	500		500
Casino	(2/VEH)	2,500,000	4,200	4,200	4,200	2,500,000	4,200	4,200	4,200
Total Vehicles in Use Per Day			31,785	16,035	19,050		17,285	12,585	15,400

PT = Public Transit

VEH = Vehicle

DU = Dwelling Units

PPL = Persons

Exhibit B-7C - Differences between Downtown Estimates of Vehicle Trips Per Day: Existing and Option 1 and Option 2

		Option 1						Option 2					
		Benchmark	Daily			Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
Downtown Employment	(3/PPL)	65,100	58,200	3,300	3,300	25,800	23,100	1,200	1,200				
Entertainment													
Playhouse Square	(2/VEH)	250,000		800	800	250,000	0	800	800				
Gateway - Indians,Cavs, Other	(2/VEH)	632,000		5,000	5,000	632,000	0	5,000	5,000				
Rock 'n Roll Hall of Fame	(2/VEH)	115,000	300		300	115,000	300		300				
Greater CLE Aquarium	(2/VEH)	50,000	150		150	50,000	150		150				
"Late Night" (HWD, E 4th)	(2/VEH)			2,000	2,000			2,000	2,000				
First Energy Stadium	(5% PT, 2/VEH)	32,000			4,000	32,000			4,000				
Wolstein Center	(2/VEH)	95,000	50	350	500	95,000	50	350	500				
CSU Visitors - Exc of Wolstein Center	(2/VEH)	31,000	120	120	200	31,000	120	120	200				
Hotels							0	0	0				
Residential	1.5 /DU (WD), 1.5/DU (WN), 4/DU (WE)		8,300	8,300	21,800		4,300	4,300	11,300				
Students	(2/VEH)	21,000	3,200	1,800	2,000	21,000	3,200	1,800	2,000				
Convention Center/Medical Mart	(2/VEH)	400,000	1,000		1,000	400,000	1,000		1,000				
Casino	(2/VEH)	5,000,000	8,400	8,400	8,400	5,000,000	8,400	8,400	8,400				
Total Vehicle Trips Per Day			79,720	30,070	49,450		40,620	23,970	36,850				

PPL = Persons

VEH = Vehicle

PT = Public Transit

DU = Dwelling Unit

WD = Weekday

WN = Weeknight

WE = Weekend

Exhibit B-8A - Differences between Health Tech Corridor Estimates of Total Daily Activities: Existing and Option 1 & Option 2

	Option 1						Option 2					
	Benchmark	Daily				Benchmark	Daily				Benchmark	Daily
		Weekday	Weeknight	Weekend			Weekday	Weeknight	Weekend			
University Circle												
Employment*	18,000	13,500	1,800	2,700		9,000	6,700	900	1,300			
Visitors/Patients**	530,000	1,600	200	5,000		265,000	800	150	500			
Students	0	0	0	0		0	0	0	0			
Residents	6,000	6,000	6,000	6,000		3,000	3,000	3,000	3,000			
Cleveland Clinic												
Employment	4,500	1,900	900	1,700		2,100	900	400	800			
Patients/Visitors	750,000	2,300	400	400		375,000	1,300	300	300			
Residents	0	0	0	0		0	0	0	0			
Campus District												
Employment	1,000	700	200	100		500	200	100	100			
Students	1,100	800	200	200		1,100	800	200	200			
Residents	1,800	1,800	1,800	1,800		900	900	900	900			
MidTown												
Employment	4,500	3,200	900	500		2,300	1,700	500	300			
Visitors												
Residents	1,000	1,000	1,000	1,000		500	500	500	500			
AsiaTown												
Employment	0	0	0	0		0	0	0	0			
Retail	0	0	0	0		0	0	0	0			
Residents	0	0	0	0		0	0	0	0			
Total Estimate of Daily Activities		32,800	13,400	19,400			16,800	6,950	7,900			

Exhibit B-8B - Differences between Health Tech Corridor Estimates of Vehicle Trips Per Day: Existing and Option 1 & Option 2

		Option 1						Option 2					
		Benchmark	Daily			Benchmark	Daily			Benchmark	Daily		
			Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend		Weekday	Weeknight	Weekend
University Circle													
Employment*	(3/D)	51,000	40,500	5,400	8,100	27,000	20,100	2,700	3,900				
Visitors/Patients**	(2/D)	706,600	2,000	400	6,400	353,200	1,200	300	700				
Students	(2/D, 2/N, 4/E)	0	0	0	0	0	0	0	400				
Residents	(2/D, 2/N, 4/E)	4,000	8,000	8,000	16,000	2,000	4,000	4,000	8,000				
Cleveland Clinic													
Employment	(3/D)	13,500	5,700	2,700	5,100	6,300	2,700	1,200	2,400				
Patients/Visitors	(2/D)	1,200,000	4,600	700	700	600,000	2,100	500	500				
Residents	(2/D, 2/N, 4/E)	0	0	0	0	0	0	0	0				
Campus District													
Employment	(3/D)	3,000	2,100	600	300	1,500	600	300	300				
Students	(2/D)	2,200	1,600	400	400	2,200	1,600	400	400				
Residents	(2/D, 2/N, 4/E)	1,400	2,800	2,800	5,600	700	1,400	1,400	2,800				
MidTown													
Employment	(3/D)	13,500	9,600	3,700	1,500	6,900	5,100	1,500	900				
Visitors													
Residents	(2/D, 2/N, 4/E)	800	1,600	1,600	3,200	400	800	800	1,600				
AsiaTown													
Employment	(3/D)	0	0	0	0	0	0	0	0				
Retail													
Residents	(4/D, 4/N, 8/E)	0	0	0	0	0	0	0	0				
Total Vehicle Trips Per Day			78,500	26,300	47,300		39,600	13,100	21,900				

D = Weekday

N = Weeknight

E = Weekend

Footnotes for Exhibits B-1A & B-1B

NOTE: All numbers greater than 1,000 are rounded to the nearest 100; numbers less than 1,000 are rounded to the nearest "50"; numbers may not add up due to rounding.

- a Downtown Employment: Based on a range of estimates from the Downtown Cleveland Alliance (100,000); 6/17/12 Plain Dealer Article- references DCA, US Census, and Ohio Labor Market Information as sources to the Cleveland Foundation Website. Estimate of 120,000 includes 14,000 Campus District Employees that are inside the downtown boundaries. Number of Campus District employees included in downtown employment based upon comparison of land area and intensity of employment in the area of the Campus District that overlaps downtown vs. the remainder of downtown; Estimates 90% of employment activity on Weekdays, 5% on weeknights and 5% on weekends. Projected approximate 20% increase including:
- b Playhouse Square: Annual estimate includes 150,000 for Cleveland Playhouse's first year downtown (Source: 2010-2011 Playhouse Square Foundation Report to Community). Estimated increase is + 250,000 (projected 22% increase, in visitors, which approximates a 1% increase/year) = 1,400,000 (Source: September 14, 2011- Playhouse Square Foundation Press Release)
- c Gateway includes Progressive Field and Quicken Loans Arena only. Annual estimate based on Indians 2010-11 total attendance (1,840,835) + Cavs 2010-11 total attendance (824,595)=2,666,000; divided by combined number of home events (81 for Indians + 41 for Cavs= 122). Averages 22,000 per event. Approx. 10 Indians games/year occur during weekdays, but because this number is so low, and many of the Gateway visitors during weekdays are presumed to already be downtown, weekday activity for Gateway were excluded; Projected 25% increase in visitors, which approximates a 1% increase/year.
- d Rock Hall: Annual based on avg. # of visitors for 2009 (477,800) & 2010 (452,100) (Source: Rock Hall's 2010 Report to the Community); Projected 25% increase in visitors, which approximates a 1% increase/year.
- e Aquarium: Annual estimate based on: Developers of the aquarium expect annual attendance ranging from 400,000 to 500,000 per year.(<http://www.newsherald.com/articles/2012/01/20/news/doc4f186cf099ad2580941212.txt?viewmode=fullstory>); Projected 25% increase in visitors, which approximates a 1% increase/year.
- f Late Nite: Based on Consultants general knowledge of these activities.
- g Browns: Annual based on 2011 regular season Cleveland Browns total attendance of: 526,874 per (<http://espn.go.com/nfl/attendance>); Based on total attendance (526,874) divided by 8 home games= 65,859; Projected 4,100 increase in average attendance.
- h Hotels: Based on occupancy of hotel visitors (3,720 hotel rooms downtown x 62% occupancy rate = 2,306); Source: (http://www.cleveland.com/business/index.ssf/2011/04/downtown_cleveland_hotels_pin.html); projected 50% increase (or +1,860) in room nights as a result of new hotel rooms being built. Total rooms increase from 3,720 existing to 5,580. 5,580 x 62% occupancy rate = 3,459.
- i Residential: As of the 2010 Census the population of Downtown Cleveland was 11,693; and "The downtown apartments in Cleveland are over 90% full right now. That means that there is somewhere between 9100 and 10500 people living in downtown Cleveland including Stonebridge west of the River. 9/19/2007 (Source: http://blog.cleveland.com/cityliving/2007/09/how_many_people_live_downtown.html); Projected 80% increase in residential units downtown. Unlike the employment estimate, the downtown resident estimate includes the west bank of the flats (i.e. Stonebridge area).
- j Reduced Office Vacancy: Based on a shift from 22% existing vacancy rate to 11%
- k Reserved

- o Reserved
- p Reserved

- q Flats East Bank: Based on 500,000 sq. ft. office space @ 220 Sq. Ft./employee (2,272 employees) + 200 employees (1/3 of total 600 employees) in the hotel and retail uses; Weeknight/weekend estimate based on 200 employees = 200 (Source: <http://www.flatseast.com/> (project details) and

Footnotes for Exhibits B-4A & B-4B

- a. Recorded from: UCI “By the Numbers” pamphlet; 5,000 residents subtracted to account for students (2 year on-campus requirement; see footnote d)

a¹ Based on 33,846 employees in 2010 and 36,758 in 2015 – $36,758 - 33,846 = 2,912/5$ years $(2015-2010) = 580/\text{year}$; $33,846 + 580(2 \text{ years}) = 35,000$

a² Based on a 20% increase in employment between 2005-2015 – 36,758 (2015 employment)*.2=7,350; $36,758 + 7,350 = 44,100$; $44,100 (2025 \text{ employment}) \cdot .2 = 8,820$; $44,100 + 8,820 = 52,920$; 52,920 (2035 employment)

a³ Assumes 2.63 persons per household (NEO CANDU, 2010); Based on a 1,000 unit increase between 2005-2015 – 1,000 new units (2,630 residents) every 10 years; 5,200 (2012 residents)+790 residents (remainder between 2012-2015 [$2,630 \text{ residents}/10 \text{ years} = 263/\text{year}$; $3[2015-2012] \cdot 263 = 790$])=6,000; $6,000 (2015 \text{ residents}) + 2,630 = 8,600$; $8,600 (2025 \text{ residents}) + 2,630 = 11,200$ (2035 residents)

- b. Data sent in an email by Debbie Berry, UCI.

b¹ Based on equating 75% weekday, 10% weeknight, 15% weekend visitor breakdown to employment

b² Based on 75% weekday, 10% weeknight, 15% weekend visitor breakdown

- c. RESERVED

- d. 24% increase which is based on major cultural institutions projected increases of an average 24% over study period

	Existing		Projected		% Change
CMA	310,145	1	450,000	1	+ 31%
CMNH	275,000	2	307,000	2	+ 10%
WRHS	110,000	3	121,000	3	+ 8%
Botanical Gardens	142,230	4	170,700	4	+ 17%
Severance Hall	102,000	5	102,000	5	-
MOCA	20,000	6	82,500	7	+ 76%

- e. Recorded from CWRU “At A Glance” webpage

- f. Day classes comprise 93% of total available classes which is based on:

- g. www.case.edu/services/ssoc.html?nw_view=1339692342&; Freshman & Sophomore required to live on campus, which assumes half of student body on campus evenings and weekends
- h. Recorded from data sent in an email from Stephen Campbell, CWRU

h¹ Recorded from Clinic "Employee Survey" - 1st shift is 61% of employees; of result 71% work weekdays only

	Total	Weekdays	Weeknights	Weekends
1st Shift	16,000 (61% of 26,200)	11,400 (71% of 16,000)	-	4,600 (16,000-11,400)
2nd/3rd Shift	10,200 (26,200-16,000)	-	5,100 (10,200/2)	5,100 (10,200/2)
Total	26,200	11,400	5,100	9,700 (4,600+5,100)

h² Recorded from Clinic "Employee Survey" - 1st shift is 61% of employees; of result 71% work weekdays only

	Total	Weekdays	Weeknights	Weekends
1st Shift	18,700 (61% of 30,700)	13,300 (71% of 18,700)	-	5,400 (18,700-13,300)

2nd/3rd Shift	12,000 (30,700-18,700)	-	6,000 (12,000/2)	6,000 (12,000/2)
Total	30,700	13,300	6,000	11,400 (5,400+6,000)

- i. Total employees and patients recorded from Silverlode Consulting Clinic Data; Total visitors based on ration of 1 visitor/patient
- j. Based on: Clinic 2010 Annual Report
- k. See footnotes g¹ and g² for distribution equation.
- l. Campus District Visitors: Annual visitors consist of annual total visitors for CSU conf. ctr. Rental (32,880) + CSU Athletics (61,000) + CSU continuing ed. (22,800) = 116,680- rounded to 116,700; Weekday- based on 50% of CSU conf. ctr. rental visitors (32,880/2= 16,440) + 70% of CSU

continuing education visitors ($22,800 \times .7 = 15,960$) ($16,440 + 15,960 = 32,400/260 = 124.62$ rounded to 100); Weeknight- based on 30% of CSU continuing ed. Visitors ($22,800 \times .3 = 6,840$) + 50% of CSU athletics visitors ($61,000/2 = 30,500$) ($6,840 + 30,500 = 37,340/260 = 143.62$ rounded to 100); Weekend- based on 50% of CSU conf. ctr rental visitors ($32,800/2 = 16,440$) + 50% of CSU athletics visitors ($61,000/2 = 30,500$) ($16,440 + 30,500 = 46,940/105 = 447.05$ rounded to 500). Percentages based upon input from CSU Director of Conference Services; Projected 20% increase in Campus District visitors across the board ($116,700 \times .2 = 23,340 + 116,700 = 140,040$ rounded to 140,000); Weekday: $32,400 \times .2 = 6,480 + 32,400 = 38,880/260 = 149.54$ rounded to 200; Weeknight: $37,340 \times .2 = 7,468 + 37,340 = 44,808/260 = 172.34$ rounded to 200; Weekend: $46,940 \times .2 = 9,388 + 46,940 = 56,328/105 = 536.45$ rounded to 500.

- m. Campus District annual employment figure from Campus District website, adjusted downward from 19,000 to 5,000 to account for employees in the Campus District that work in the overlapping downtown employment boundaries. Reduction based upon comparison of land area and intensity of employment in the area of the Campus District that overlaps downtown vs. the remainder of downtown (Source: <http://campusdistrict.org/about-us>); Weekday: Based on 70% of employees working on weekdays ($5,000 \times .7 = 3,500$); Weeknight: Based on 20% of employees working on weeknights ($5,000 \times .2 = 1,000$); Weekend: Based on 10% of employees working on weekends ($15,000 \times .1 = 500$); Projected increase based on a 10% increase in employees + 240 employees derived from Campus District E22nd Plan new construction + 200 employees derived from St. Vincent Charity Hospital Master Facility Plan. ($5,000 + 500$ [10% increase] + 240 + 200 = 5,940-rounded to 6,000); Projected weekdays ($6,000 \times .7 = 9,200$); weeknights ($6,000 \times .2 = 1,200$); ($6,000 \times .1 = 600$).
- n. Annual Wolstein Center Guests for 2011 (375,000), per the General Manager; Based on average attendance of 1,300/event. ($375,000/287 \text{ events} = 1,306$). Although we have shown equal distribution between weekdays, weeknights and weekends, the distribution of events and avg. attendance per event is not constant. Venues are closer to capacity and, thus, have more activity units on weeknights and weekends than during weekdays; Projected 25% increase in Wolstein Ctr. attendance. 25% increase approximates a 1% increase/year = average attendance of 1,635/event. ($468,000/287 \text{ events} = 1,633$). Estimate based on a constant number of events.
- o. Campus District annual students: Based on total CSU ($17,000 + 70 \text{ NeoMed}$) + Tri-C students at Metro Campus (10,343) and Unified Technology Center (211) + 90% of Conf. Facility Academic Class use, which is Saturday only and includes CSU students that attend classes outside of Mon-Fri ($1,008$) = ($17,070 + 10,554 + 1,008$) = 10,600 students). Student counts received at 3/30/12 conversational interview with CSU officials and e-mail correspondence with Tri-C and CSU conf. ctr. officials; Weekday- based on 70% of Tri-C students; Weeknight- 20% of Tri C students; Weekend- Based on 10% of Tri-C students (1,055) Projected 10% increase in Tri-C enrollment; All percentages based upon input from CSU and Tri-C officials.
- p. Campus District Residents: Based on Census 2010 population figures provided by Rocky Richardson following conversational interview (3,206 rounded to 3,200); Projected is based on 1,200 new units for CSU from interview from Campus District per E22nd redevelopment plan) ($4,803 + 160 = 4,963$).
- q. MidTown annual employment figures provided by MidTown- less employment for establishments outside of MidTown service area; 70% of employees working on weekdays; 20%

of employees working on weeknights; 10% of employees working on weekends; Projected based on 4,498 new employees based upon figures for new development contained in Penn Sq. Neighborhood Plan, 2005 MidTown MPlan Update, and 2008 MidTown East District Plan. Plus known investment that could generate an additional 1,000 to 2,000 employees.

- r. RESERVED for MidTown visitors
- s. MidTown Residents per MidTown Website (Source: <http://www.midtowncleveland.org/the-community.aspx>); 1,035 new residential units based upon figures for new development contained in Penn Sq. Neighborhood Plan, 2005 MidTown MPlan Update, and 2008 MidTown East District Plan.
- t. Recorded from 2010 GIS Auditor data and assumes 230 square feet/office employee (U.S. General Services Administration) and 945 square feet/retail employee (U.S. Energy Information Administration)
- u. Assumes 75% weekday, 12.5 weeknight, 12.5 weekend employee breakdown

Appendix C

Estimated Vehicle Trips by Location of Origin

NOACA TAZ	Exhibit 14A - Downtown Forecast in Vehicle Trips Per Day to 2035: Option 1 Submitted 12/21/12, Revised 1/15/13						
	Traffic Zone (Study Area)	Residents	Students	Employees	Visitors	Hotels	Total Daily Vehicle Trips
162	44	0	0	0	0	0	0
161	45	0	0	0	0	0	0
53	46	0	0	0	0	0	0
54	47	0	0	0	0	0	0
55	48	0	0	0	0	0	0
25	49	0	0	0	0	0	0
39	50	0	0	0	0	0	0
36	51	0	0	0	0	0	0
40	52	0	0	0	0	0	0
38	53	0	0	0	0	0	0
24	54	0	0	0	5,350	0	5,350
37	55	0	0	0	0	0	0
29	56	0	0	0	0	0	0
22	57	0	0	0	1,070	0	1,070
23	58	3,320	0	0	0	0	3,320
18	59	0	0	0	0	0	0
27	60	0	0	0	5,350	0	5,350
21	61	0	0	12,300	2,140	0	14,440
19	62	3,320	0	0	0	0	3,320
30	63	0	0	0	0	0	0
31	64	0	0	0	0	0	0
32	65	0	0	0	0	0	0
47	66	0	0	0	0	0	0
46	67	0	0	0	0	0	0
28	68	0	0	0	0	0	0
11	69	0	0	12,300	0	0	12,300
12	70	0	0	12,300	0	0	12,300
13	71	0	0	0	0	0	0
14	72	0	0	0	0	0	0
15	73	3,320	0	0	5,350	0	8,670
17	74	0	0	0	0	0	0
6	75	3,320	0	12,300	0	0	15,620
16	76	0	0	0	0	0	0
7	77	0	0	12,300	0	0	12,300
8	78	0	0	0	1,070	0	1,070
9	79	0	0	0	0	0	0
10	80	0	0	0	1,070	0	1,070
4	81	0	0	0	0	0	0
45	82	3,320	0	0	0	0	3,320
50	83	0	0	0	0	0	0
44	84	0	0	0	0	0	0
52	85	0	0	0	0	0	0
3	86	0	0	0	0	0	0
1	87	0	0	0	0	0	0
2	88	0	0	0	0	0	0
43	89	0	0	0	0	0	0
42	90	0	0	0	0	0	0
	Total Trips	16,600	0	61,500	21,400	0	99,500

Appendix C-1 - Health Tech Corridor Forecast in Vehicle Trips Per Day to 2035: Option 1 Submitted 12/21/12, Revised 1/28/13								
	NOACA TAZ	Traffic Zone (Study Area)	Residents	Students	Employees	Visitors/Patients	Hotels	Total Daily Vehicle Trips
Campus District		Campus District	5,600	3,200	2,700	0	0	11,500
	51	1	0	0	0	0	0	0
	35	2	0	0	0	0	0	0
	33	3	2,800	1,600	540	0	0	4,940
	34	4	2,800	1,600	540	0	0	4,940
	41	5	0	0	0	0	0	0
	53	6	0	0	0	0	0	0
	168	7	0	0	1,080	0	0	1,080
	165	8	0	0	0	0	0	0
	172	9	0	0	540	0	0	540
		Area Subtotal Trips	5,600	3,200	2,700	0	0	11,500
Midtown		MidTown	3,200	0	13,300	0	0	16,500
	173	10	0	0	1,330	0	0	1,330
	169	11	0	0	1,330	0	0	1,330
	174	12	0	0	1,330	0	0	1,330
	170	13	0	0	1,330	0	0	1,330
	171	14	0	0	1,330	0	0	1,330
	175	15	0	0	1,330	0	0	1,330
	176	16	0	0	0	0	0	0
	255	17	0	0	1,330	0	0	1,330
	262	18	0	0	1,330	0	0	1,330
	261	19	800	0	1,330	0	0	2,130
	256	20	800	0	1,330	0	0	2,130
	257	21	800	0	0	0	0	800
	260	22	800	0	0	0	0	800
			Area Subtotal Trips	3,200	0	13,300	0	0
Cleveland Clinic		Cleveland Clinic	0	0	8,400	5,300	0	13,700
	266	23	0	0	0	0	0	0
	267	24	0	0	840	530	0	1,370
	77	25	0	0	2,520	1,590	0	4,110
	74	26	0	0	0	0	0	0
	75	27	0	0	2,100	1,325	0	3,425
	78	28	0	0	2,100	1,325	0	3,425
	76	29	0	0	840	530	0	1,370
			Area Subtotal Trips	0	0	8,400	5,300	0
UCI		UCI	16,000	0	50,000	2,400	0	68,400
	64	30	4,000	0	0	0	0	4,000
	65	31	0	0	0	0	0	0
	72	32	0	0	0	0	0	0
	269	33	0	0	0	0	0	0
	73	34	0	0	0	0	0	0
	71	35	0	0	0	0	0	0
	63	36	0	0	12,500	600	0	13,100
	58	37	0	0	0	0	0	0
	59	38	4,000	0	12,500	600	0	17,100
	62	39	0	0	0	0	0	0
	61	40	8,000	0	12,500	600	0	21,100
	66	41	0	0	0	0	0	0
	68	42	0	0	12,500	600	0	13,100
	70	43	0	0	0	0	0	0
		Area Subtotal Trips	16,000	0	50,000	2,400	0	68,400
AsiaTown		AsiaTown	0	0	0	0	0	0
	177	91	0	0	0	0	0	0
	178	92	0	0	0	0	0	0
	179	93	0	0	0	0	0	0
	180	94	0	0	0	0	0	0
			Area Subtotal Trips	0	0	0	0	0
All SubAreas Trips Total			24,800	3,200	74,400	7,700	0	110,100

Appendix C-2 - Origin of Downtown and Health Tech Corridor Trips: Option 1 Submitted 12/21/12, Revised 1/28/13						
	Residents	Students	Employees	Visitors/Patients	Hotels	Total Daily Vehicle Trips
Health Tech Corridor	24,800	3,200	74,400	7,700	0	110,100
Downtown	16,600	0	61,500	21,400	0	99,500
Total	41,400	3,200	135,900	29,100	0	209,600
Distribution						
West	10,350	800	33,975	7,275	0	52,400
I-90	4,140	300	13,590	2,910	0	20,940
I-80	4,140	300	13,590	2,910	0	20,940
Rt. 20	2,070	200	6,795	1,455	0	10,520
Southwest (I-71)	10,350	800	33,975	7,275	0	52,400
South	10,350	800	33,975	7,275	0	52,400
I-77	4,140	300	13,590	2,910	0	20,940
I-271/Rt. 8	4,140	300	13,590	2,910	0	20,940
I-480	2,070	200	6,795	1,455	0	10,520
East	10,350	800	33,975	7,275	0	52,400
Rt. 422	2,070	160	6,795	1,455	0	10,480
Rt. 87	2,070	160	6,795	1,455	0	10,480
Chagrin	2,070	160	6,795	1,455	0	10,480
Rt. 322	2,070	160	6,795	1,455	0	10,480
Rt. 90/2	2,070	160	6,795	1,455	0	10,480

Appendix D

Existing Development by Traffic Zones

Appendix D - Health Tech Corridor GIS Land Use Development by Traffic Zone

T-Z	Unassigned		Residential		Offices	Hotels		Hospital/Medical	Industrial	Hum Serv	Parking		University	Cultural	Vacant		Retail	Retail/Auto	Retail-Rec	Other		Total
	Owners	Sq Ft	Sq Ft	Units		Sq Ft	Rms				Floor Area	Land			Fir Area	Land				Sq Ft	Notes	
Campus District	1		0						127,000	37,800			5,800				3,900	26,400				200,900
	2		0										722,600									722,600
	3		0						0				301,900									301,900
	4		0						0				2,322,000									2,322,000
	5		0	433,600	256	52,000			23,800				378,200			0.3				68,700	1	956,300
	6					6,400																6,400
	7	County	205,500	2,500		242,600			4,600	33,000							15,700	77,700		8,500	2	590,100
	8	County	80,500	120,700					592,700													793,900
	9	County	64,100	173,300	150	44,100				230,700					0	1.6	31,800		46,500			590,500
MidTown	9																					
	10	state	53,700	177,700	120	253,300				495,400					0	1.6	35,100	15,600		71,900	3	1,102,700
	11		5,400	131,900	138	259,900			12,900	196,100					2.6	62,100	1,300	21,300		86,600	4	777,500
	12		0	19,100	12	132,700				1,008,200		115,900			0.6	8,200	2,200	203,400		170,600	5	1,660,300
	13		40,100	66,300	33	269,400	104,800			207,800					4.3	26,500	46,700			9,900	6	771,500
	14		0	49,000	55	181,000				288,600		158,600			2.6	95,300	9,200			160,200	7	941,900
	15		1,600	19,600	17	167,400				147,100		188,100			1.7	25,500	6,000	8,000				563,300
	16		0	36,000	21					856,800		59,400			1		17,300			17,600	8	987,100
	17		0	4,200	9					140,000					15,300	4.9	76,900	9,800				246,200
	18				4					278,400					3.6							278,400
	19		11,900	124,200	23					1,036,400					8,400	4.9	2,200	22,500		17,900	9	1,223,500
	20	County	57,200	29,600	7					275,700			0		0.9	15,500				6,400	10	384,400
	21		0	288,500	317					49,000					2.7	16,000	1,900			13,600	11	369,000
	22		0	82,600	97	59,700				337,000			2,000		3.5	38,700	79,000	20,000		153,700	12	772,700
Cleveland Clinic	23	City	9,700	68,200	62	8,200				22,000					2.1	26,900						135,000
	24		0	221,400	178	5,400				2,300					1,300	2.5	4,500	18,500		53,900	13	307,300
	25	City	2,600	66,100	68					0	1,447,100				1.8	61,400	34,500			102,000	14	1,713,700
	26	CC/Rel	0	282,200	137				20,200						2	120,400				9,400	15	432,200
	27		0	36,200					180,600		16,200				1.4							233,000
	28		0				407,500	299	6,399,000	0										54,400	16	6,860,900
	29	USA	17,600				151,600	232	1,002,400	0					1.7	10,400						1,182,000
	29																					
UC	30		0						300,600					83,100						98,500	17	482,200
	31	City	21,900	576,100					73,100						1.4	5,100				34,200	18	710,400
	32								476,900													476,900
	33			9,400			221,400			8,900					2.2					94,700	24	334,400
	34			18,900	22	22,600			49,200		279,900				1.2	9,000						379,600
	35	UCI	11,700	16,000	24					3,600					0.9					342,000	19	373,300
	36		0														214,300			54,100	20	268,400
	37		0	24,000					706,000						16,500	0.7				15,400	21	761,900
	38	UCI/Oh	51,300	425,900	281	8,700	32,900			0			1,189,000	221,400	0.9	12,900				26,500	22	1,968,600
	39		0	211,000	198	150,000							633,100	315,400	2.6					132,400	23	1,441,900
	40	UCI	15,500	409,700	434					6,500	107,500			172,500	121,900	2.1						833,600
	41			88,400	78				1,071,300						0.5	331,700						1,491,400
	42		0						3,365,500				1,994,700									5,360,200
	43	state	378,300										1,380,000									1,758,300
Asiatown	91		5,100	251,000	167	114,500				215,900					1,850	1.0	181,500					768,000
	92			190,700	136					203,900					1.4	153,300	31,100			3,500	25	582,600
	93		1,300	358,400	244	61,700				311,900					4.0		12,400			64,400	26	810,100
	94		2,500	99,000	79					53,900					2.2	4,100	4,400			19,100	27	183,000
Total			1,037,500	5,111,400		2,039,600	918,200		14,255,000	6,559,900	576,000	1,834,500	0	8,929,300	792,400	165,250	1,588,900	416,500	299,200	1,890,100		46,412,000

Appendix E

Conversational Interviews Questionnaire

____ Anonymous Response?

Interviewee

Business

Interview Date

Interviewer(s)

1. **What is your understanding of the proposed Innerbelt changes?**
(IE – what interchanges are proposed to move, what interchanges are proposed to be eliminated, the construction timeline, etc.)

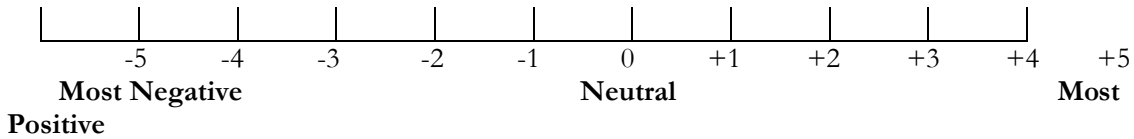
- ____ Good (knows which interchanges are impacted and how)
 ____ Basic (knows there are reconfigurations to the Innerbelt)
 ____ None
 ____ Incorrect

If interviewee has no knowledge of the proposed Innerbelt changes, then explain what is happening and show them the map.

2. **What is your relationship to the Corridor?**
(Check all that apply.)

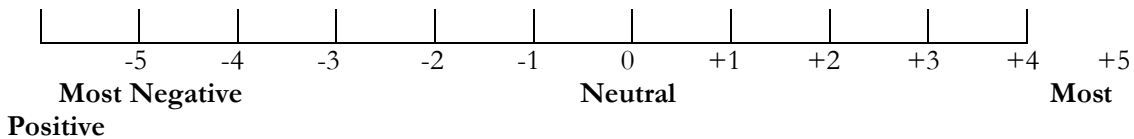
- ____ I work here
 ____ My business is here
 ____ I live here
 ____ I visit here
 ____ Other
 ____ Other

3. **What is your opinion on the proposed reconfigured interchanges in terms of its impact on your business?**



4. **What is the basis for your opinion in #3 – regarding impacts on your business?**

5. **What is your opinion on the proposed reconfigured interchanges in terms of its impact on the corridor?**



6. **What is the basis for your opinion in #5 – regarding impacts on the corridor?**

7. **What are the impacts you envision? Be specific.**

- a. **Your Business**

- b. **The Corridor**

8. **Where will these impacts be felt? Be specific.**
(IE – specific locations, specific activities. Utilize map.)

9. **Will you do anything differently to respond to the changes should they occur?**

☐ Yes
☐ No

10. **If so, what will you do?**
(Utilize map.)

11. **Is there anything else you'd like us to know?**
